GMB-C2160-LLVA

System Board
User's Manual

J24800245

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FCC and DOC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

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About this Manual

An electronic file of this manual is included in the CD. To view the user's manual in the CD, insert the CD into a CD-ROM drive. The autorun screen (Main Board Utility CD) will appear. Click "User's Manual" on the main menu.

Warranty

1. Warranty does not cover damages or failures that arised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.

2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.

3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.

4. We will not be liable for any indirect, special, incidental or consequencial damages to the product that has been modified or altered.

Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.

2. Wear an antistatic wrist strap.

3. Do all preparation work on a static-free surface.

4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.

5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.

Important:
Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

Safety Measures

To avoid damage to the system:
- Use the correct AC input voltage range.

To reduce the risk of electric shock:
- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

Battery:
- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.

About the Package

The system board package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

- ☑ One GMB-C2160-LLVA board
- ☑ Two Serial ATA data cables
- ☑ Two USB port cables
- ☑ Two COM port cables
- ☑ One I/O shield
- ☑ One DVD
- ☑ One QR (Quick Reference)

Optional Items

- ☑ I/O shield
- ☑ USB port cable
- ☑ COM port cable
- ☑ Serial ATA data cable
- ☑ Serial ATA power cable
- ☑ PS/2 Keyboard/Mouse cable

The system board and accessories in the package may not come similar to the information listed above. This may differ in accordance to the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

Before Using the System Board

Before using the system board, prepare basic system components.

If you are installing the system board in a new system, you will need at least the following internal components.

- A CPU
- Memory module
- Storage devices such as hard disk drive, CD-ROM, etc.

You will also need external system peripherals you intend to use which will normally include at least a keyboard, a mouse and a video display monitor.

Chapter 1 - Introduction

Specifications

Processor	• LGA 1155 socket for: - 3rd Generation processors (22nm process technology) : Intel® Xeon® E3-1275v2 (8M Cache, up to 3.9GHz); 77W : Intel® Xeon® E3-1225v2 (8M Cache, up to 3.6GHz); 77W : Intel® Core® i7-3770 (8M Cache, up to 3.9GHz); 77W : Intel® Core® i5-3550S (6M Cache, up to 3.7GHz); 65W : Intel® Core® i3-3220 (3M Cache, 3.3GHz); 55W : Intel® Pentium® G2120 (3M Cache, 3.1GHz); 65W - 2nd Generation processors (32nm process technology) : Intel® Xeon® E3-1275 (8M Cache, up to 3.8GHz); 95W : Intel® Xeon® E3-1225 (6M Cache, up to 3.4GHz); 95W : Intel® Core® i7-2600 (8M Cache, up to 3.8GHz); 95W : Intel® Core® i5-2400 (6M Cache, up to 3.4GHz); 95W : Intel® Core® i3-2120 (3M Cache, 3.3GHz); 65W : Intel® Pentium® G850 (3M Cache, 2.9GHz); 65W
Chipset	• Intel® C216 Express chipset
System Memory	• Four 240-pin DDR3 DIMM sockets • Supports DDR3 1333/1600MHz (3rd generation processors) Supports DDR3 1066/1333MHz (2nd generation processors) • Supports dual channel memory interface • Supports up to 32GB system memory • DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3 DRAM technologies are supported for x8 and x16 devices, unbuffered, ECC
Expansion Slots	• 2 PCIe x16 slots - Supports Gen 3.0 (3rd generation processors) - Supports Gen 2.0 (2nd generation processors) - 1 x16 signal or 2 x8 signals • 2 PCIe x4 slots (PCIe 2.0) - 1 x4 signal and 1 x1/x4 signal • 1 Mini PCIe slot: PCIe and USB signals (PCIe 2.0) • 3 PCI slots (PCI 2.3)
Graphics	• Intel® HD Graphics 4000P • Display ports: HDMI, 2 DVI-I (1 supports DVI-D signal only) • HDMI and DVI display resolution up to 1920x1200 • VGA display resolution up to 2048x1536 pixels with 32-bit color at 75Hz • Intel® Clear Video Technology • Intel® Advanced Vector Extensions (Intel® AVX) Instructions • Supports DirectX 11 and OGL 3.0

LAN	• Intel® WG82579LM with iAMT8.0 Gigabit Ethernet Phy • Intel® WG82574L PCI Express Gigabit Ethernet controller • Integrated 10/100/1000 transceiver • Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
Serial ATA	• 6 Serial ATA ports - 2 SATA 3.0 ports with data transfer rate up to 6Gb/s - 4 SATA 2.0 ports with data transfer rate up to 3Gb/s (SATA port 4 provides adequate space for SATA DOM) • Integrated Advanced Host Controller Interface (AHCI) controller • Supports RAID 0/1/5/10
Intel Active Management Technology (AMT)	• Supports iAMT8.0 • Out-of-band system access • Remote troubleshooting and recovery • Hardware-based agent presence checking • Proactive alerting • Remote hardware and software asset tracking
TPM (optional)	• Provides a Trusted PC for secure transactions • Provides software license protection, enforcement and password protection
USB Interface	• XHCI Host Controller supports up to 4 super speed USB 3.0 ports
Rear Panel I/O Ports	• 1 mini-DIN-6 port for PS/2 mouse/keyboard • 4 USB 3.0/2.0/1.1 ports • 2 USB 2.0/1.1 ports • 1 DB-9 serial port - Supports RS232/422/485 (RS232 and/or Power) • 1 HDMI port • 2 DVI-I ports (1 supports DVI-D signal only) • 2 RJ45 LAN ports
I/O Connectors	• 3 connectors for 6 external USB 2.0/1.1 ports • 5 connectors for 5 external serial ports - 1 RS232/422/485 (RS232 and/or Power) - 4 RS232 • 1 8-bit Digital I/O connector • 1 front audio connector for line-out and mic-in jacks • 1 CD-in connector • 1 S/PDIF connector • 6 Serial ATA ports (2 SATA 3.0; 4 SATA 2.0) • 1 24-pin ATX power connector • 1 8-pin 12V power connector • 1 chassis intrusion connector • 1 front panel connector • 3 fan connectors

BIOS	• AMI BIOS • 64Mbit SPI BIOS
Energy Efficient Design	• Supports ErP Lot6 power saving (optional) • ACPI v3.0 specification • System Power Management • Wake-On-Events include: - Wake-On-PS/2 KB/Mouse - Wake-On-USB KB/Mouse - Wake-On-LAN - RTC timer to power-on the system • CPU stopped clock control • AC power failure recovery
Damage Free Intelligence	• Monitors CPU/system temperature and overheat alarm • Monitors VCORE/5V/3.3V/V_DIMM/12V/5VSB voltages and failure alarm • Monitors CPU/system fan speed and failure alarm • Read back capability that displays temperature, voltage and fan speed • Watchdog timer function
Temperature	• Operating: 0°C to 60°C • Storage: -20°C to 85°C
Humidity	• 10% to 90%
Dimensions	• ATX form factor • 305mm (12") x 244mm (9.6")

Features

Watchdog Timer

The Watchdog Timer function allows your application to regularly "clear" the system at the set time interval. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

DDR3

DDR3 delivers increased system bandwidth and improved performance. It offers peak data transfer rate of up to 21 Gb/s bandwidth. The advantages of DDR3 are its higher bandwidth and its increase in performance at a lower power than DDR2.

Graphics

The integrated Intel HD graphics for graphics intensive applications delivers exceptional 3D, 2D and video capabilities. It supports HDMI and 2 DVI-I interfaces.

DVI

DVI (Digital Visual Interface) is a form of video interface technology made to maximize the quality of flat panel LCD monitors and modern video graphics cards. Data is transmitted using the TMDS (Transition Minimized Differential Signaling) protocol, providing a digital signal from the PC's graphics subsystem to the display.

PCI Express

PCI Express is a high bandwidth I/O infrastructure that possesses the ability to scale speeds by forming multiple lanes. The x4 PCI Express lane supports transfer rate of 1 Gigabyte per second. The PCI Express architecture also provides a high performance graphics infrastructure by enhancing the capability of a x16 PCI Express lane to provide 8 Gigabytes per second transfer rate.

Intel Active Management Technology (AMT)

Intel Active Management Technology (Intel® AMT) allows remote access and management of networked systems even while PCs are powered off, remotely repair systems after OS failures and has the capability to remotely update all systems with the latest security software.

Serial ATA

Serial ATA is a storage interface that is compliant with SATA 1.0a specification. SATA 3.0 supports speed up to 6Gb/s while SATA 2.0 supports speed up to 3Gb/s. This improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s. The board supports RAID 0/1/5/10.

Gigabit LAN

The Intel WG82579LM PHY and Intel WG82574L PCI Express Gigabit controllers support up to 1Gbps data transmission.

USB

The system board supports the new USB 3.0. It is capable of running at a maximum transmission speed of up to 5 Gbit/s (625 MB/s) and is faster than USB 2.0 (480 Mbit/s, or 60 MB/s) and USB 1.1 (12Mb/s). USB 3.0 reduces the time required for data transmission, reduces power consumption, and is backward compatible with USB 2.0. It is a marked improvement in device transfer speeds between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

Wake-On-LAN

This feature allows the network to remotely wake up a Soft Power Down (Soft-Off) PC. It is supported via the onboard LAN port or via a PCI LAN card that uses the PCI PME (Power Management Event) signal. However, if your system is in the Suspend mode, you can power-on the system only through an IRQ or DMA interrupt.

Important:
The 5V_standby power source of your power supply must support ≥720mA.

Wake-On-PS/2

This function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system.

Important:
The 5V_standby power source of your power supply must support ≥720mA.

Wake-On-USB

This function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state.

Important:
If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the 5V_standby power source of your power supply must support ≥1.5A. For 3 or more USB ports, the 5V_standby power source of your power supply must support ≥2A.

RTC Timer

The RTC installed on the system board allows your system to automatically power-on on the set date and time.

ACPI STR

The system board is designed to meet the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enables PCs to implement Power Management and Plug-and-Play with operating systems that support OS Direct Power Management. ACPI when enabled in the Power Management Setup will allow you to use the Suspend to RAM function.

With the Suspend to RAM function enabled, you can power-off the system at once by pressing the power button or selecting "Standby" when you shut down Windows® without having to go through the sometimes tiresome process of closing files, applications and operating system. This is because the system is capable of storing all programs and data files during the entire operating session into RAM (Random Access Memory) when it powers-off. The operating session will resume exactly where you left off the next time you power-on the system.

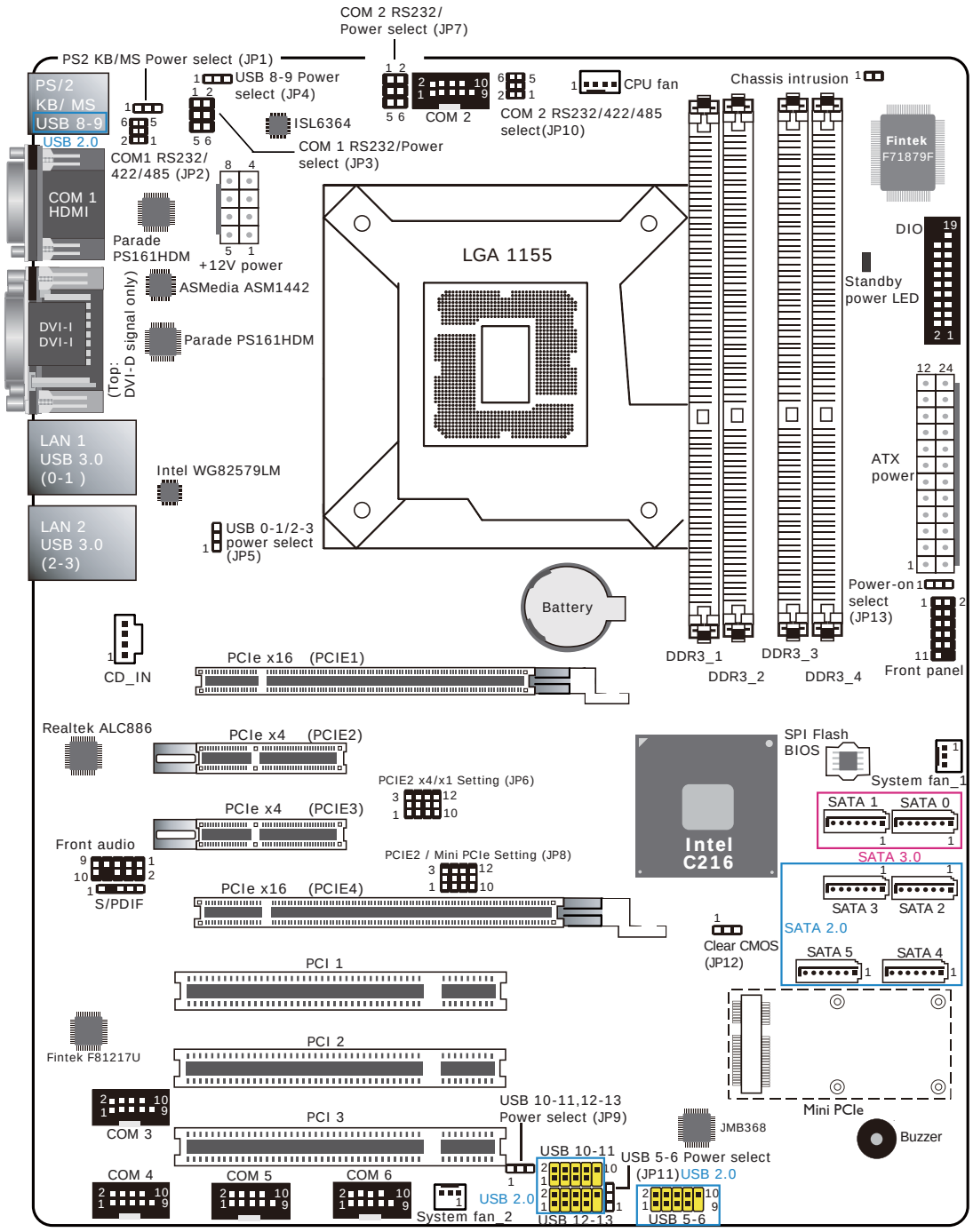
Important:
The 5V_standby power source of your power supply must support ≥720mA.

Power Failure Recovery

When power returns after an AC power failure, you may choose to either power-on the system manually or let the system power-on automatically.

Chapter 2 - Hardware Installation

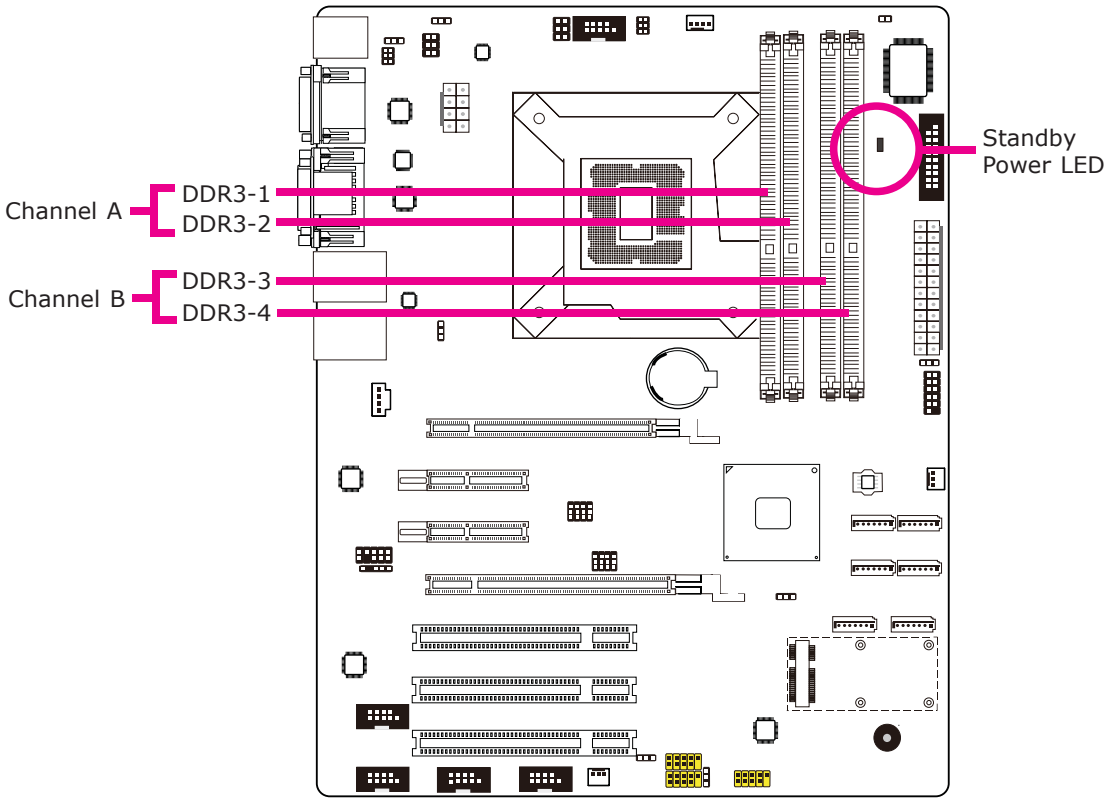
System Board Layout



Important:
Electrostatic discharge (ESD) can damage your system board, processor, disk drives, add-in boards, and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

System Memory

Important:
When the Standby Power LED lit red, it indicates that there is power on the system board. Power-off the PC then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.



Features

- The four DIMM sockets are divided into 2 channels:

  Channel A - DDR3_1 and DDR3_2
  Channel B - DDR3_3 and DDR3_4

- Dual channel memory interface

- Maximum of 32GB system memory

The system board supports the following memory interface.

Single Channel (SC)

Data will be accessed in chunks of 64 bits (8B) from the memory channels.

Dual Channel (DC)

Data will be accessed in chunks of 128 bits from the memory channels. Dual channel provides better system performance because it doubles the data transfer rate.

Single Channel	DIMMs are on the same channel. DIMMs in a channel can be identical or completely different. However, we highly recommend using identical DIMMs. Not all slots need to be populated.
Dual Channel	DIMMs of the same memory configuration are on different channels.

Important:

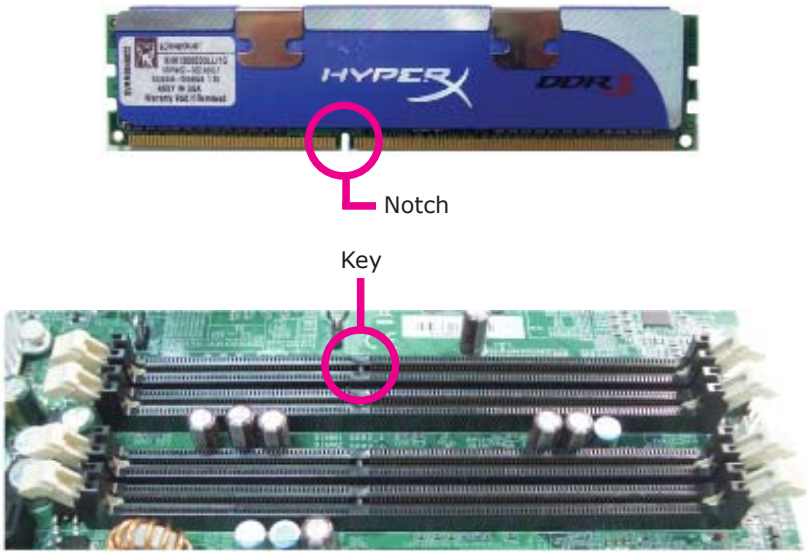
1. You can populate either Channel A or Channel B first.
2. When installing a DIMM in Channel A or Channel B, always populate the socket that is farthest the CPU. In this case, it will mean populating DDR3-2 and/or DDR3-4 first.
3. If you intend to use dual channel, the same rule applies - always the socket farthest the CPU. Populate DDR3-2 and/or DDR3-4 first; not DDR3-2 and DDR3-3 and not DDR3-1 and DDR3-4.

Installing the DIM Module

Note:
The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the DIMM socket on the system board.
4. Push the "ejector tabs" which are at the ends of the socket to the side.

5. Note how the module is keyed to the socket.



6. Grasping the module by its edges, position the module above the socket with the "notch" in the module aligned with the "key" on the socket. The keying mechanism ensures the module can be plugged into the socket in only one way.

7. Seat the module vertically, pressing it down firmly until it is completely seated in the socket.

8. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.

CPU

The system board is equipped with a surface mount LGA 1155 socket. This socket is exclusively designed for installing a LGA 1155 packaged Intel CPU.

Important:

1. Before you proceed, make sure (1) the LGA 1155 socket comes with a protective cap, (2) the cap is not damaged and (3) the socket's contact pins are not bent. If the cap is missing or the cap and/or contact pins are damaged, contact your dealer immediately.
2. Make sure to keep the protective cap. RMA requests will be accepted and processed only if the LGA 1155 socket comes with the protective cap.

Note:

The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.

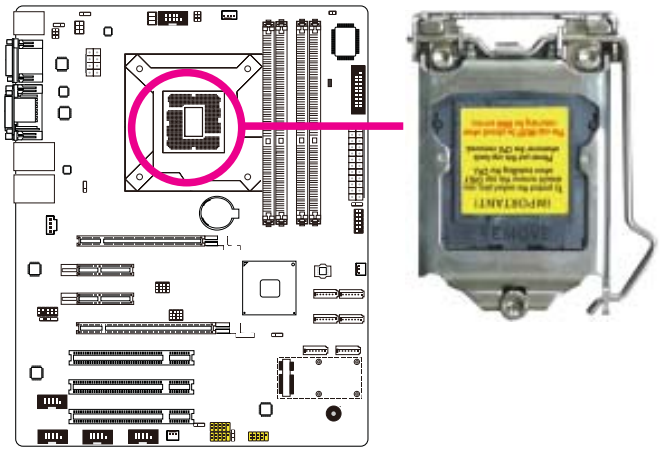
Installing the CPU

1. Make sure the PC and all other peripheral devices connected to it has been powered down.

2. Disconnect all power cords and cables.

3. Locate the LGA 1155 CPU socket on the system board.

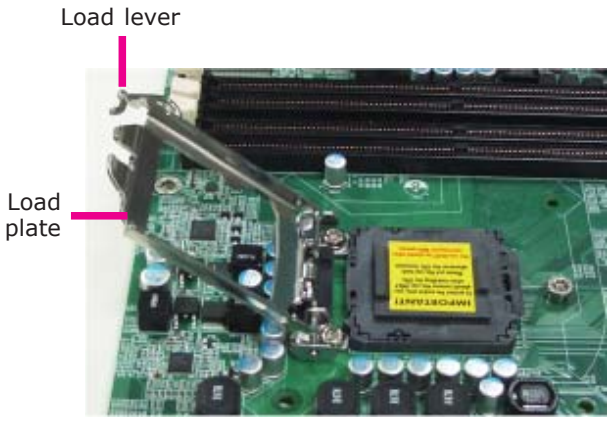
   Important:
   The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure. Remove the protective cap only when you are about to install the CPU.



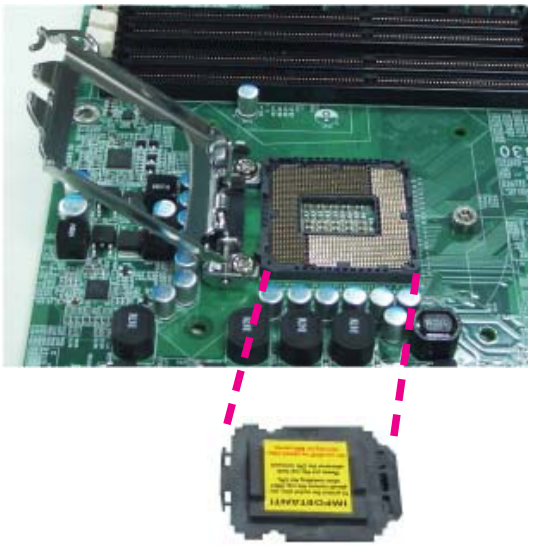
4. Unlock the socket by pushing the load lever down, moving it sideways until it is released from the retention tab; then lift the load lever up.

5. Lifting the load lever will at the same time lift the load plate.

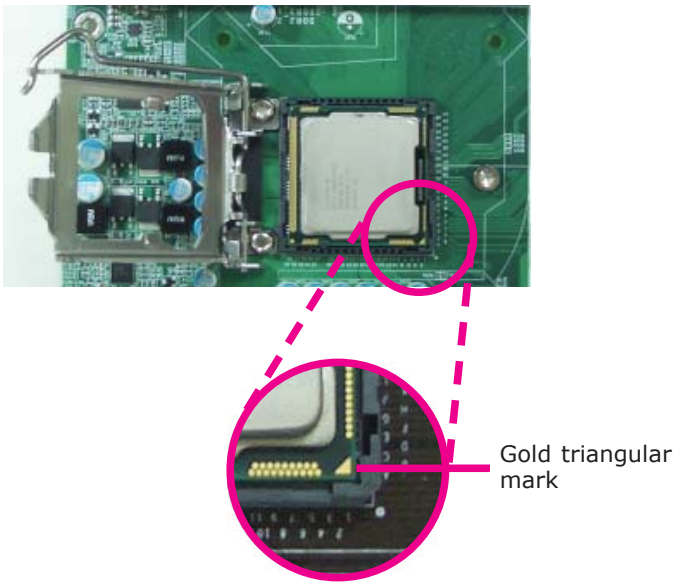
   Lift the load lever up to the angle shown on the photo.



6. Remove the protective cap from the CPU socket. The cap is used to protect the CPU socket against dust and harmful particles. Remove the protective cap only when you are about to install the CPU.

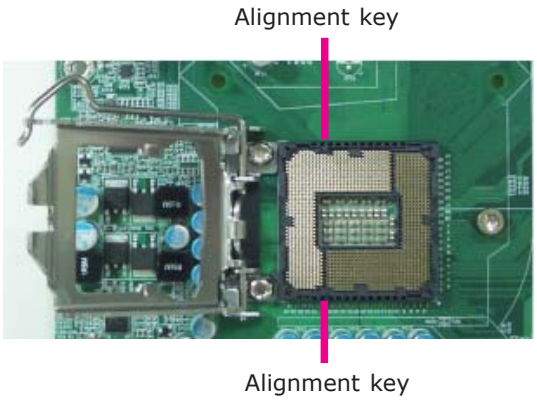


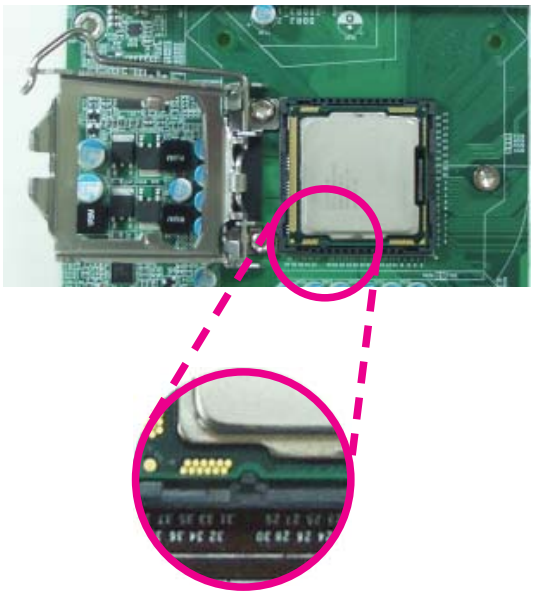
7. Insert the CPU into the socket. The gold triangular mark on the CPU must align with the corner of the CPU socket shown on the photo.



The CPU's notch will at the same time fit into the socket's alignment key.

Important:
The CPU will fit in only one orientation and can easily be inserted without exerting any force.

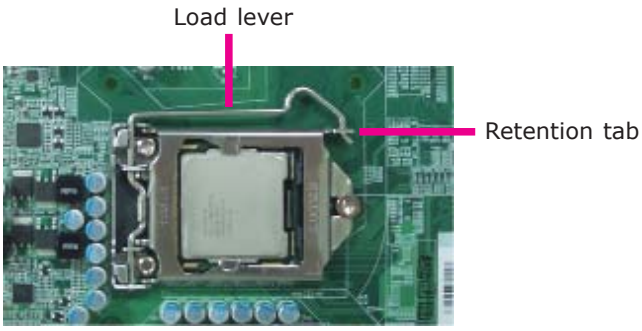




8. Close the load plate then push the load lever down.

   While closing the load plate, make sure the front edge of the load plate slides under the retention knob.

9. Hook the load lever under the retention tab.



Installing the Fan and Heat Sink

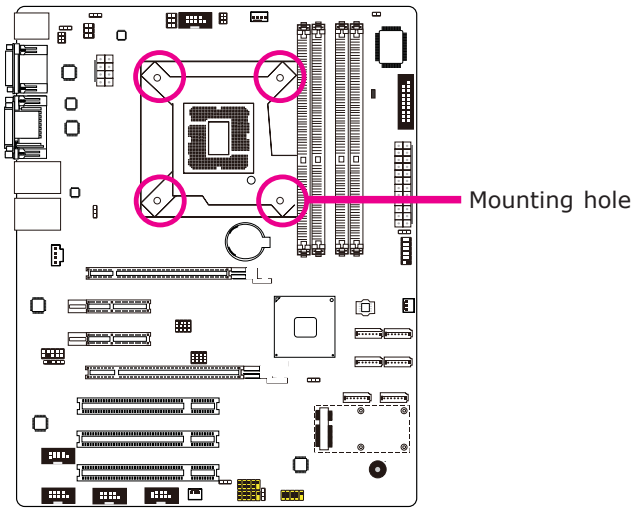
The CPU must be kept cool by using a CPU fan with heat sink. Without sufficient air circulation across the CPU and heat sink, the CPU will overheat damaging both the CPU and system board.

Note:
A boxed Intel® processor already includes the CPU fan and heat sink assembly. If your CPU was purchased separately, make sure to only use Intel®-certified fan and heat sink.

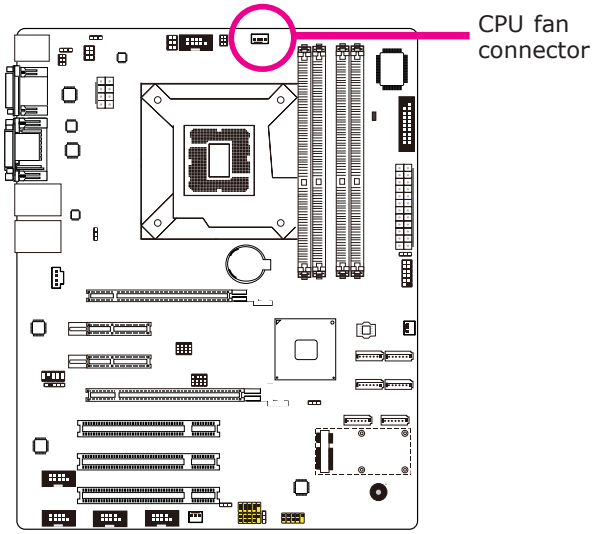
1. Before you install the fan / heat sink, you must apply a thermal paste onto the top of the CPU. The thermal paste is usually supplied when you purchase the fan / heat sink assembly. Do not spread the paste all over the surface. When you later place the heat sink on top of the CPU, the compound will disperse evenly.

   Some heat sinks come with a patch of pre-applied thermal paste. Do not apply thermal paste if the fan / heat sink already has a patch of thermal paste on its underside. Peel the strip that covers the paste before you place the fan / heat sink on top of the CPU.

2. Place the heat sink on top of the CPU. The 4 push-pins around the heat sink, which are used to secure the heat sink onto the system board, must match the 4 mounting holes around the socket.

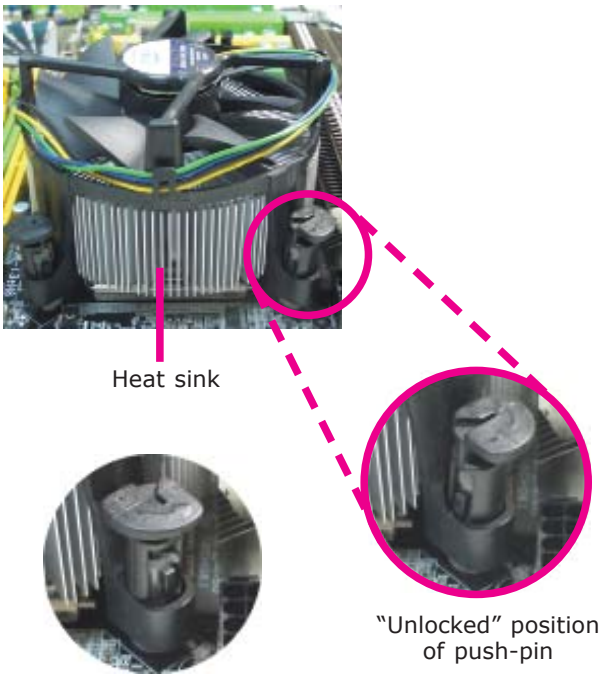


3. Orient the heat sink such that the CPU fan's cable is nearest the CPU fan connector.

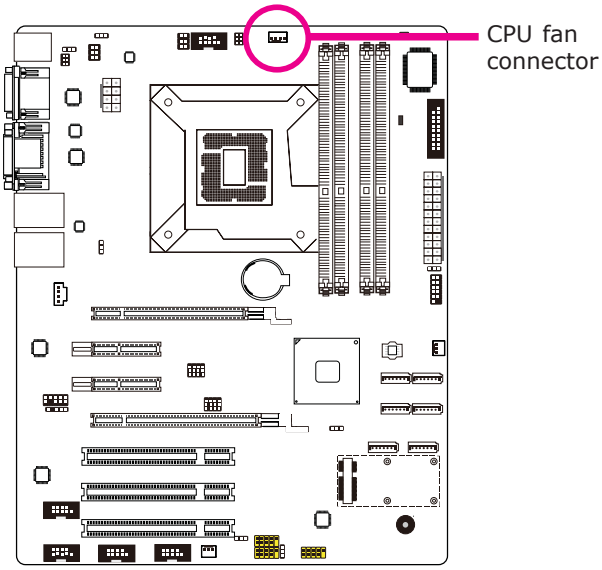


4. Rotate each push-pin according to the direction of the arrow shown on top of the pin.

   Push down two pushpins that are diagonally across the heat sink. Perform the same procedure for the other two push-pins.

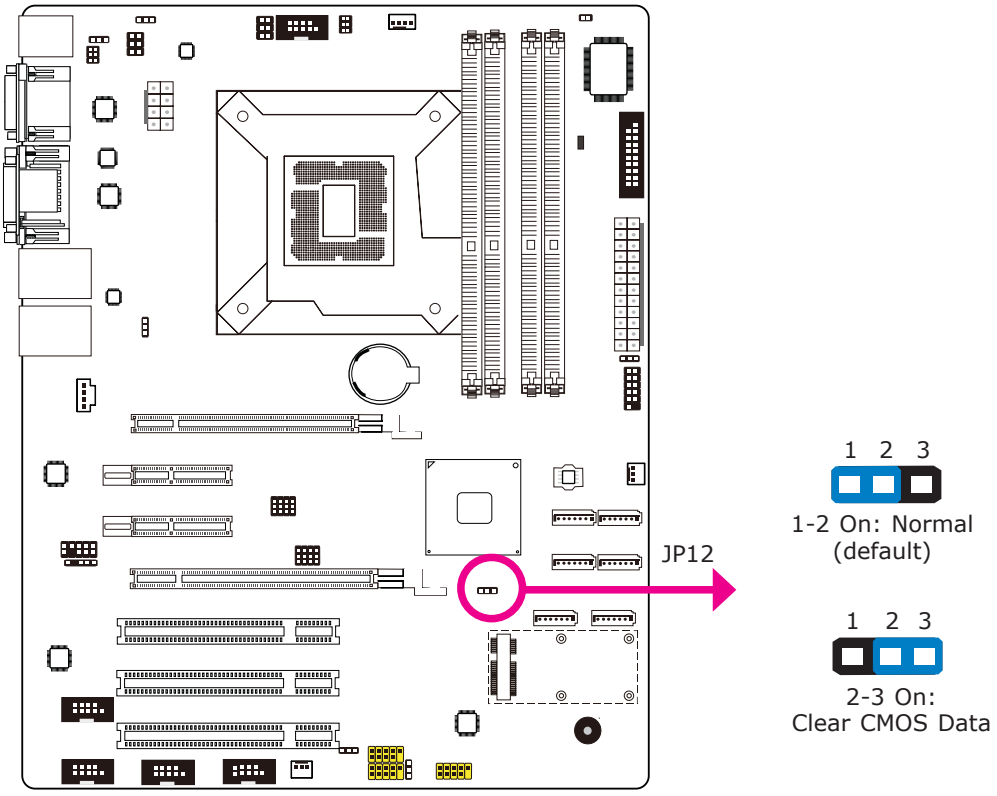


5. Connect the CPU fan's cable to the CPU fan connector on the system board.



Jumper Settings

Clear CMOS Data



If you encounter the following,

a) CMOS data becomes corrupted.
b) You forgot the supervisor or user password.

you can reconfigure the system with the default values stored in the ROM BIOS.

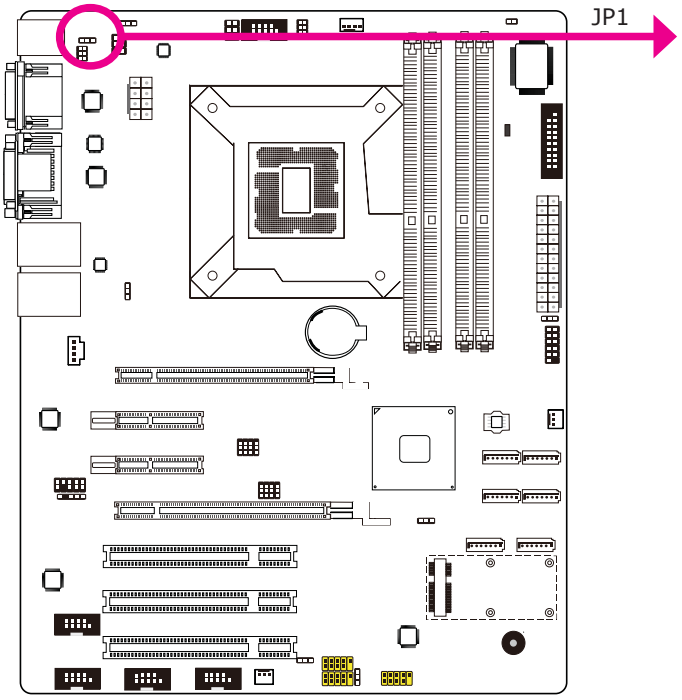
To load the default values stored in the ROM BIOS, please follow the steps below.

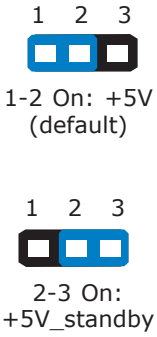
1. Power-off the system and unplug the power cord.

2. Set JP12 pins 2 and 3 to On. Wait for a few seconds and set JP12 back to its default setting, pins 1 and 2 On.

3. Now plug the power cord and power-on the system.

PS/2 Power Select

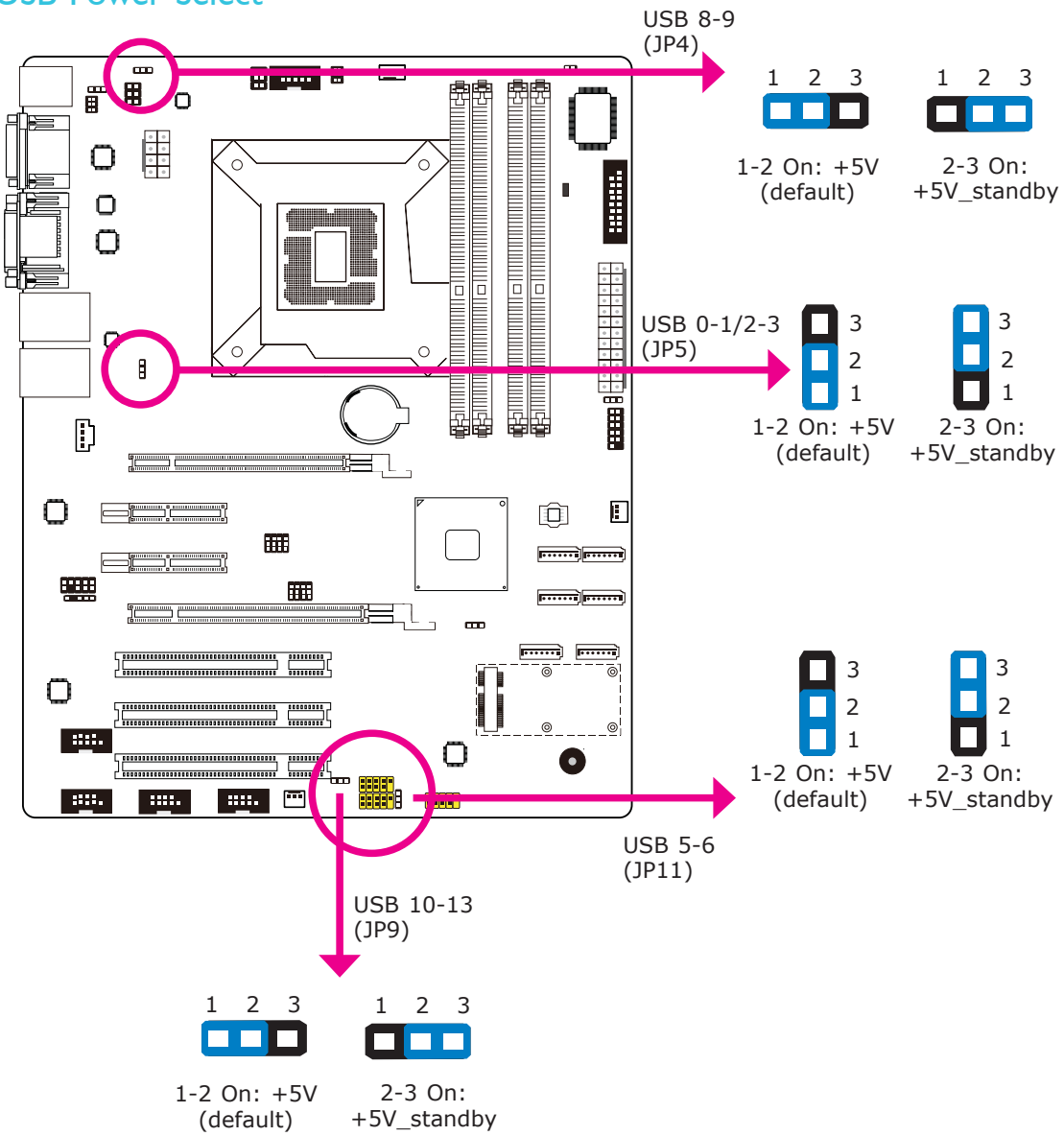




JP1 is used to select the power of the PS/2 keyboard and PS/2 mouse ports. Selecting +5V_standby will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.

Important:
The +5VSB power source of your power supply must support ≥720mA.

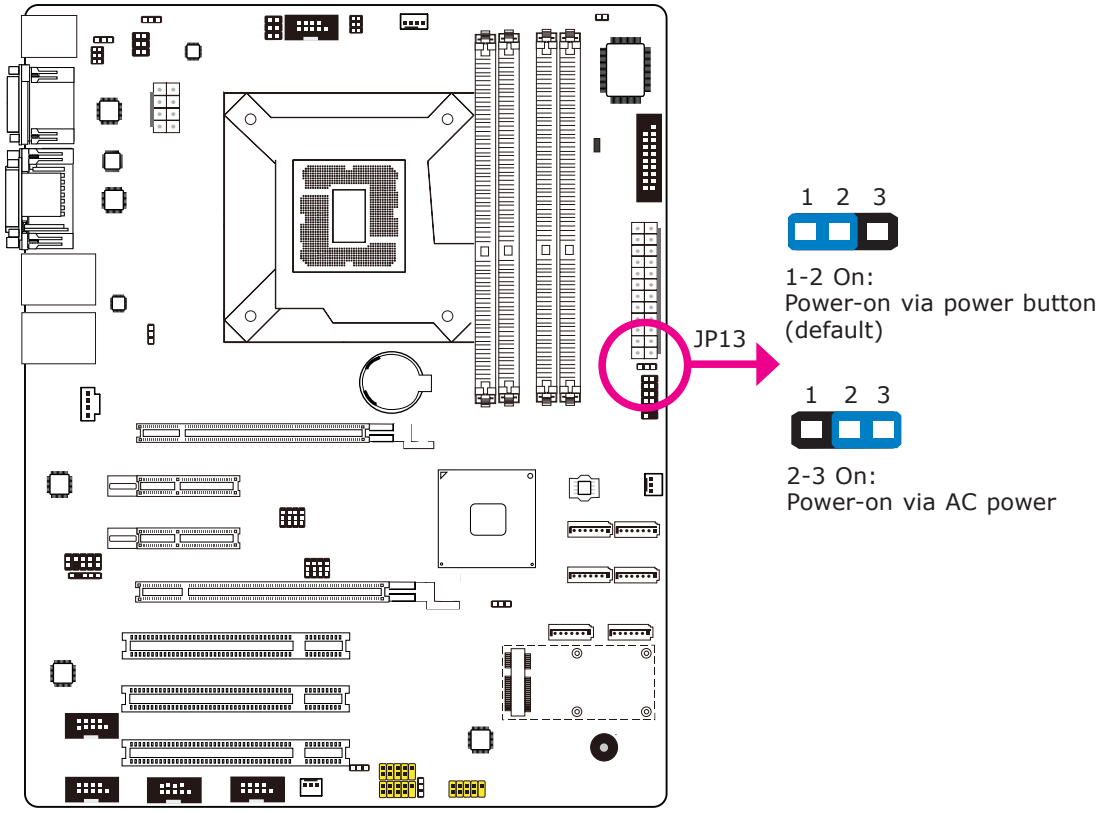
USB Power Select



These jumpers are used to select the power of the USB ports. Selecting +5V_standby will allow you to use a USB device to wake up the system.

Important:
If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V_standby power source of your power supply must support ≥1.5A. For 3 or more USB ports, the +5V_standby power source of your power supply must support ≥2A.

Power-on Select

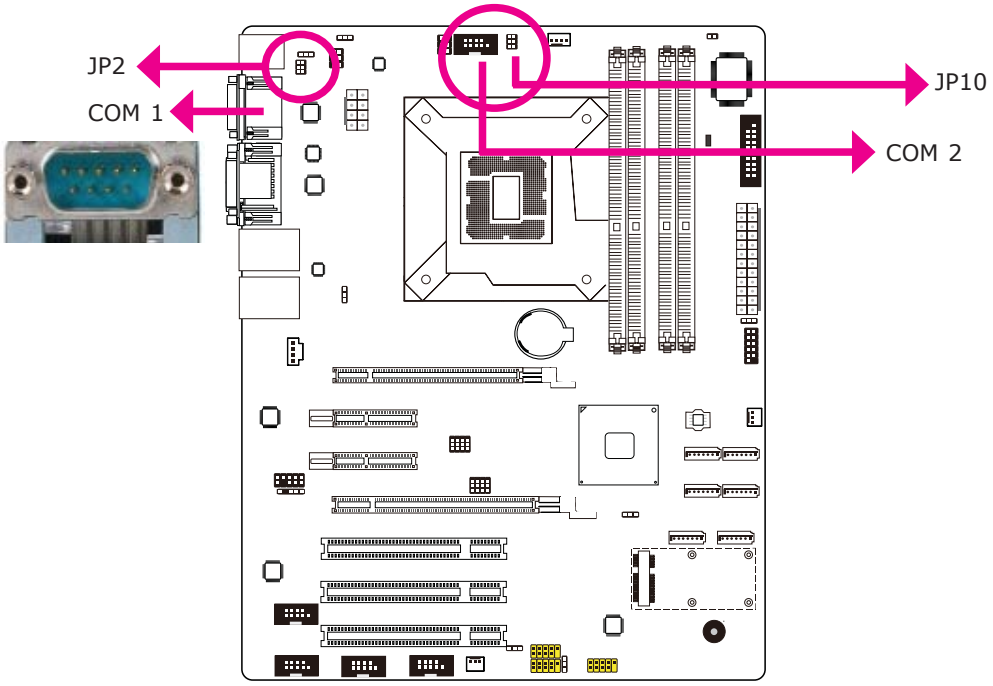


JP13 is used to select the method of powering on the system. If you want the system to power-on whenever AC power comes in, set JP13 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

When using the JP13 "Power On" feature to power the system back on after a power failure occurs, the system may not power on if the power lost is resumed within 5 seconds (power flicker).

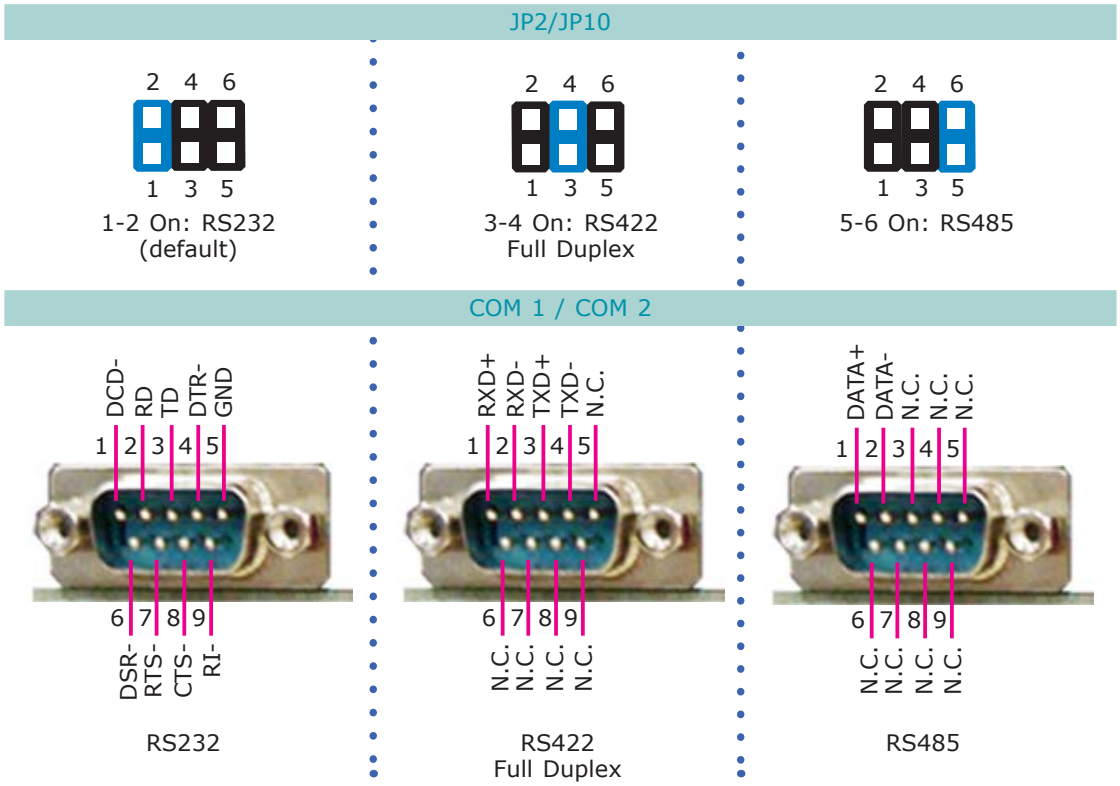
Note:
In order to ensure that power is resumed after a power failure that recovers within a 5 second period, JP13 must be set to pins 2-3 and the "AC Power Lose" in CMOS is set to "On".

COM1/COM2 RS232/RS422/RS485 Select

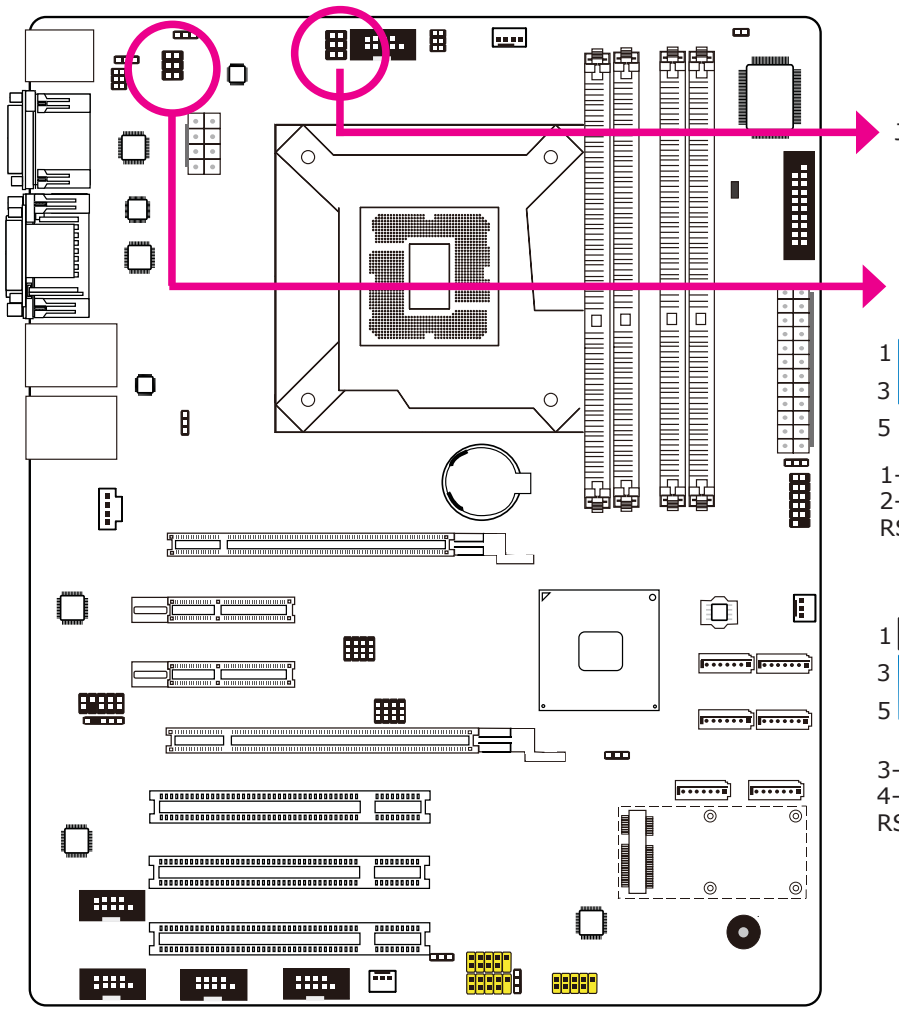


JP2 (for COM1) and JP10 (for COM2) are used to configure the COM ports to RS232, RS422 (Full Duplex) or RS485.

The pin function of the COM ports will vary according to the jumper's setting.



COM1/COM2 RS232/Power Select



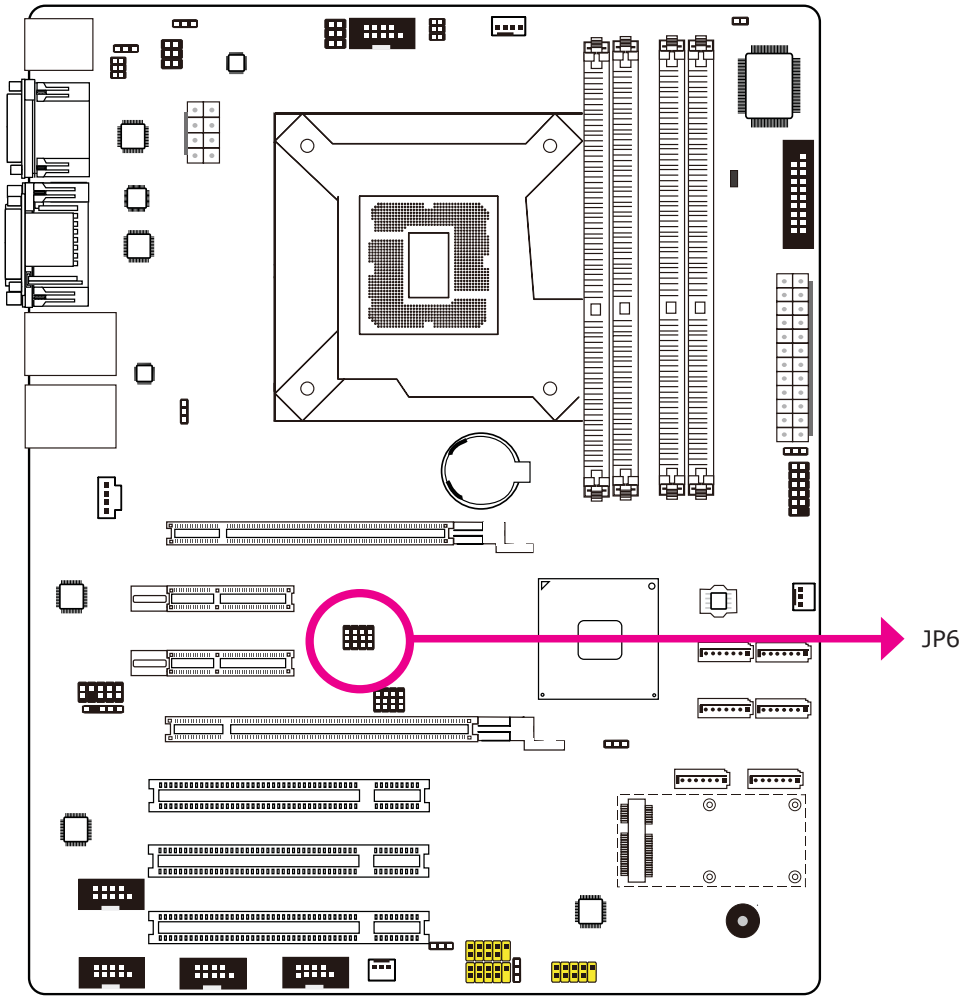
1 2
3 4
5 6

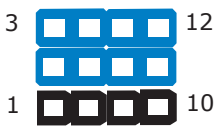
1-3 (RI),
2-4 (DCD) On:
RS232 (default)

1 2
3 4
5 6

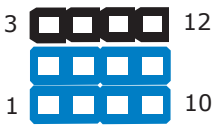
3-5 (+5V),
4-6 (+12V) On:
RS232 with power

PCIE2 x4/ x1 Setting





2-5-8-11, 3-6-9-12 On:
PCIE2 signal from CPU (for x4 PCIe card) (default)



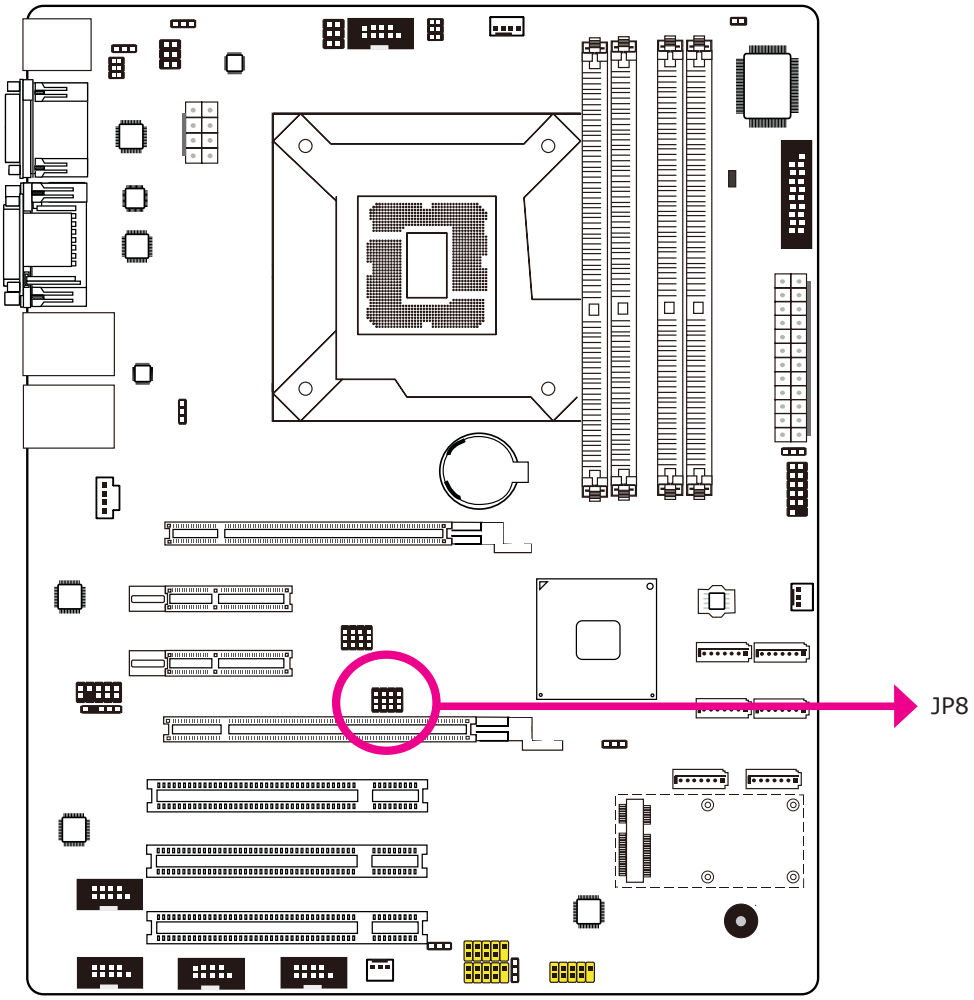
1-4-7-10, 2-5-8-11 On:
PCIE2 signal from PCH (for x1 PCIe card)

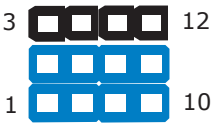
Note:

1. When JP6 is set to no signal, ignore JP8. (Supports Mini PCIe) If JP6 is set to x1, make sure JP8 is set to x1, too. (Mini PCIe not supported)

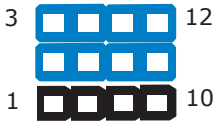
2. Use JP6's default settings to avail the best configurations of the PCI Express slots. However, not all processors provide 20 lanes of PCI Express bus. If your processor only supports 16 lanes of PCI Express bus, set the jumper according to the instruction shown above.

PCIE2/ Mini PCIe Setting





1-4-7-10, 2-5-8-11 On:
Mini PCIe slot (default)



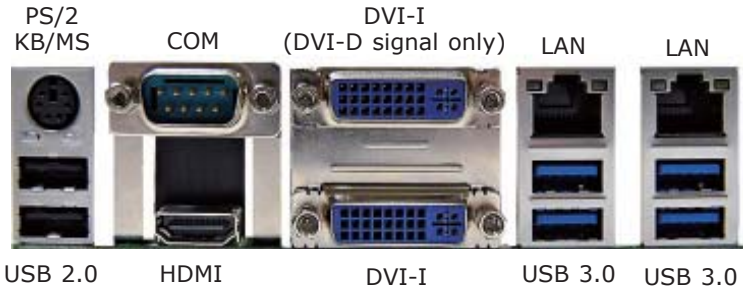
2-5-8-11, 3-6-9-12 On:
PCIE2 signal from PCH (for x1 PCIe card)

Note:

1. When JP6 is set to no signal, ignore JP8. (Supports Mini PCIe)
   If JP6 is set to x1, make sure JP8 is set to x1, too. (Mini PCIe not supported)

2. Use JP8's default settings to avail the best configurations of the PCI Express slots. However, not all processors provide 20 lanes of PCI Express bus. If your processor only supports 16 lanes of PCI Express bus, set the jumper according to the instruction shown above.

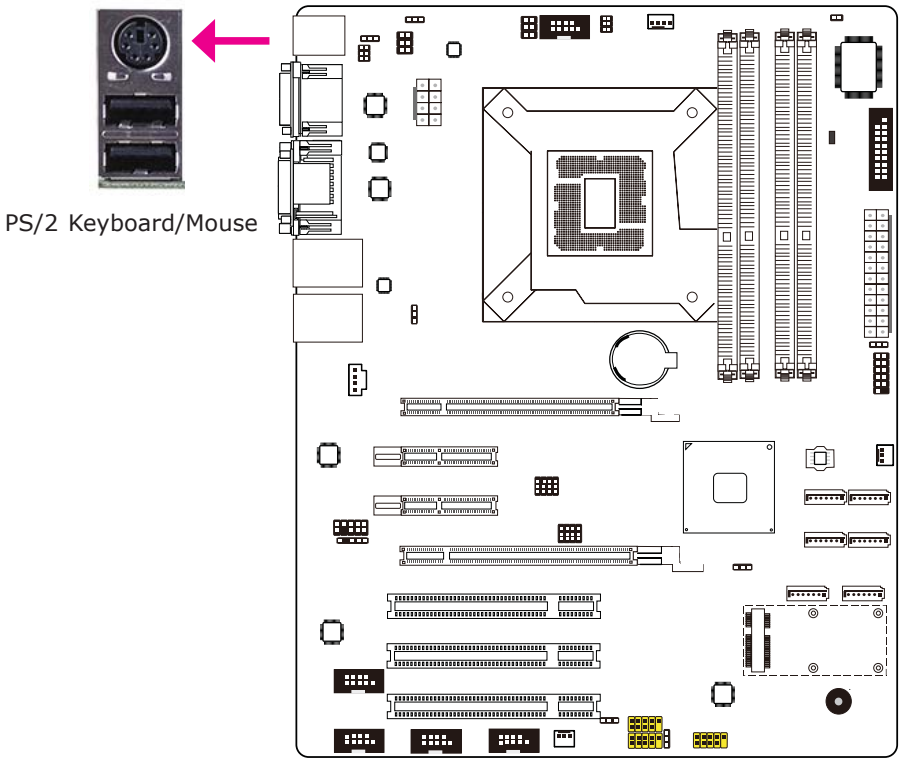
Rear Panel I/O Ports



The rear panel I/O ports consist of the following:

- PS/2 keyboard/ mouse port
- 1 COM port
- HDMI port
- DVI-I port (DVI-D signal only)
- DVI-I port
- 2 Intel LAN port
- 6 USB ports

PS/2 Mouse and PS/2 Keyboard Ports



These ports are used to connect a PS/2 mouse and a PS/2 keyboard. The PS/2 mouse port uses IRQ12.

Wake-On-PS/2 Keyboard/Mouse

The Wake-On-PS/2 Keyboard/Mouse function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system. To use this function:

- Jumper Setting

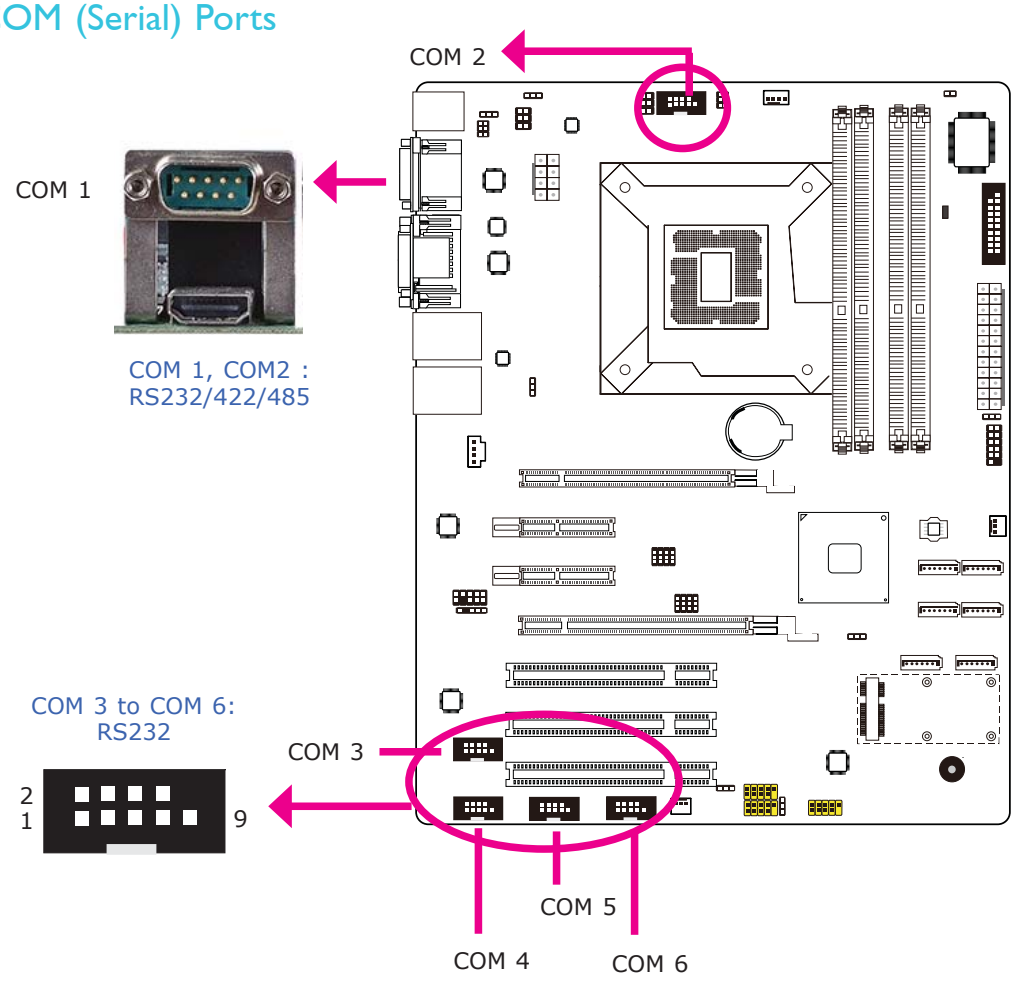
  JP1 must be set to "2-3 On: +5V_standby". Refer to "PS/2 Power Select" in this chapter for more information.

- BIOS Setting

  Configure the PS/2 keyboard/mouse wake up function in the Advanced menu ("ACPI Power Management Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

Important:
The +5V_standby power source of your power supply must support ≥720mA.

COM (Serial) Ports



COM 3 to COM 6 are fixed at RS232.

The pin function of COM 1 and COM 2 ports will vary according to JP3/JP7's setting. Refer to "COM1/COM2 RS232/RS422/RS485 Select" in this chapter for more information.

The serial ports are asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.

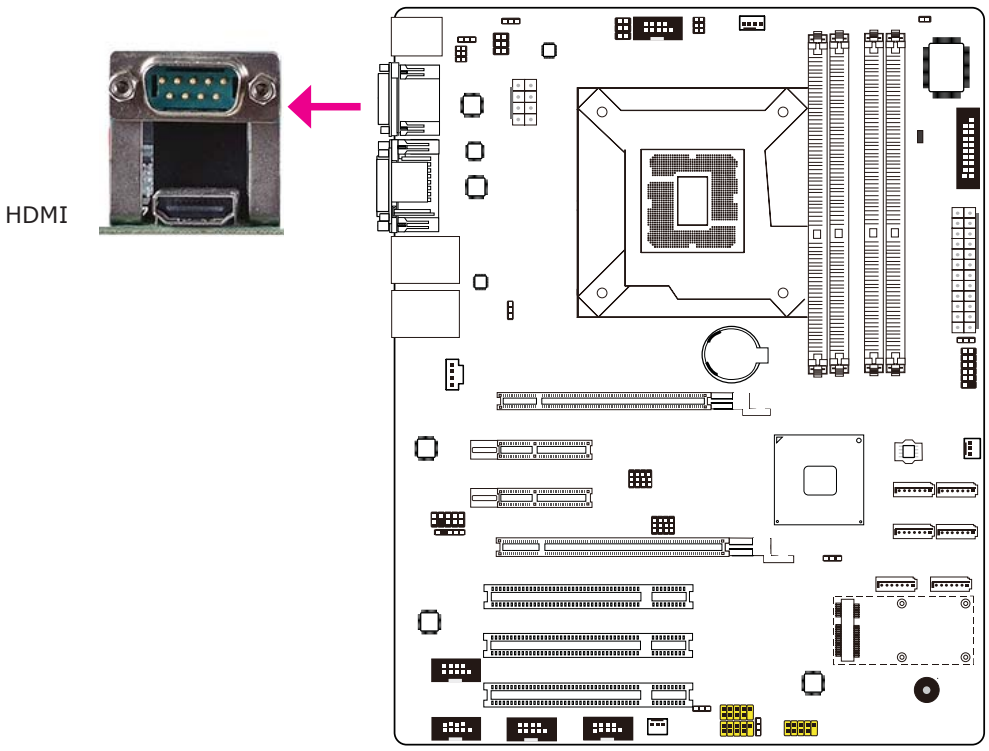
Connecting External Serial Ports

Your COM port may come mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the serial port cable to the COM connector. Make sure the colored stripe on the ribbon cable is aligned with pin 1 of the COM connector.

BIOS Setting

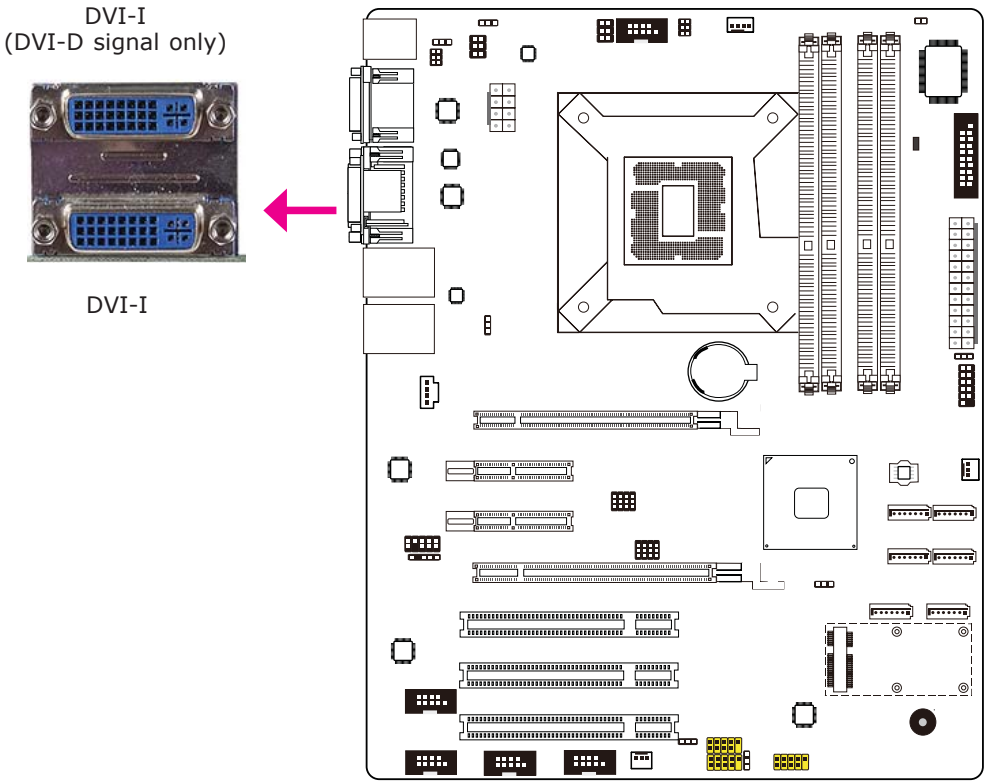
Configure the serial ports in the Advanced menu ("Super IO Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

HDMI Port



The HDMI port which carries both digital audio and video signals is used to connect a LCD monitor or digital TV that has the HDMI port.

DVI-I Port



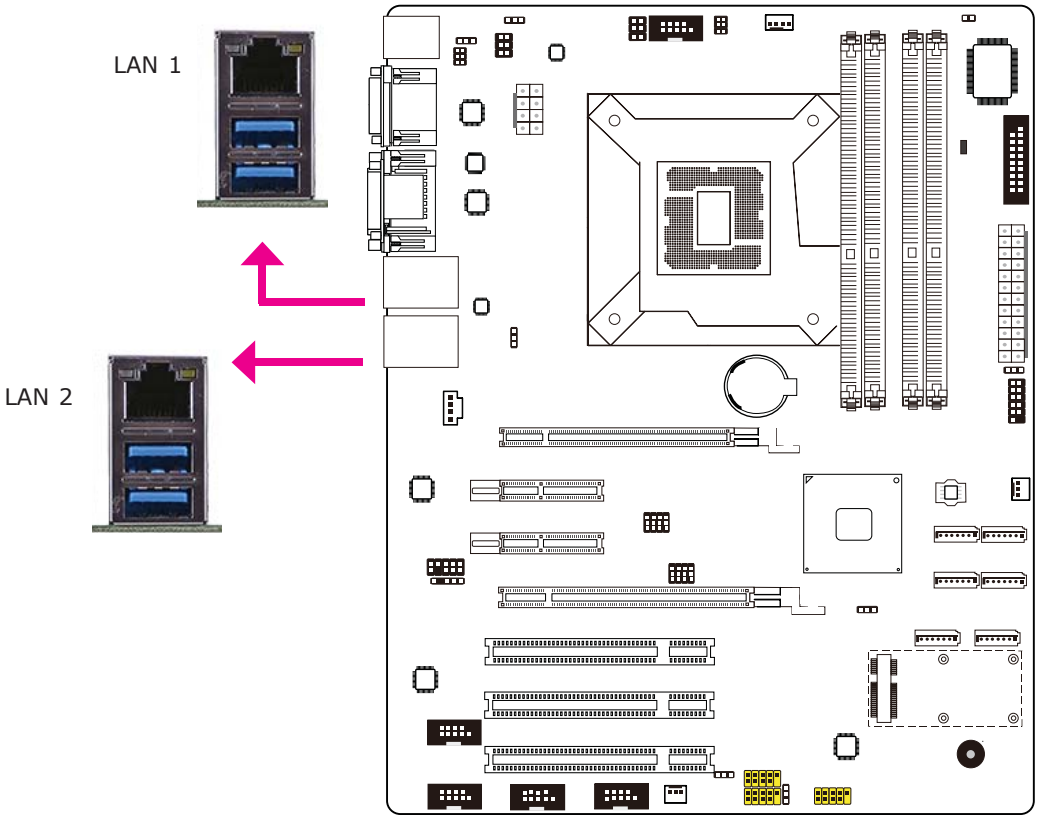
The DVI-I port is used to connect an LCD monitor. This port supports DVI-D signal only.

Connect the display device's cable connector to the DVI-I port. After you plug the cable connector into the port, gently tighten the cable screws to hold the connector in place.

BIOS Setting

Configure the display device in the Chipset menu ("North Bridge Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

RJ45 LAN Ports



Features

- Intel 82579LM with iAMT8.0 Gigabit Ethernet Phy
- Intel 82574L PCI Express Gigabit Ethernet controller

The LAN ports allow the system board to connect to a local area network by means of a network hub.

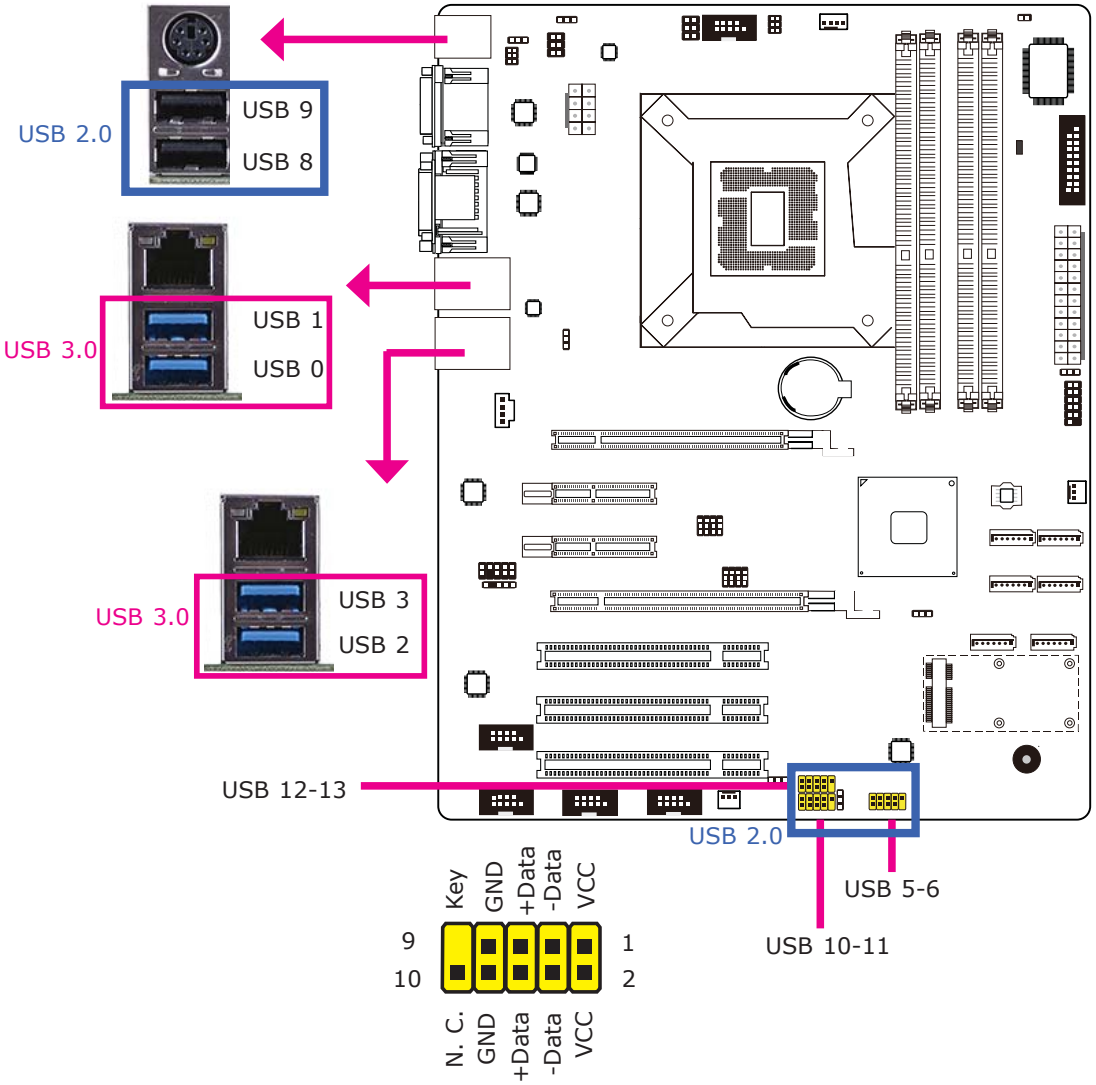
BIOS Setting

Configure the onboard LAN in the Chipset menu ("South Bridge Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install the LAN drivers. Refer to chapter 4 for more information.

USB Ports



USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The system board is equipped with four onboard USB 3.0/2.0/1.1 ports (USB 0-3) and two onboard USB 2.0/1.1 ports (USB 8-9). The three 10-pin connectors allow you to connect 6 additional USB 2.0/1.1 ports (USB 5-6/ USB 10-13). The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis and then insert the USB port cables to a connector.

BIOS Setting

Configure the onboard USB in the Advanced menu ("USB Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

You may need to install the proper drivers in your operating system to use the USB device. Refer to your operating system's manual or documentation for more information.

Wake-On-USB Keyboard/Mouse

The Wake-On-USB Keyboard/Mouse function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state. To use this function:

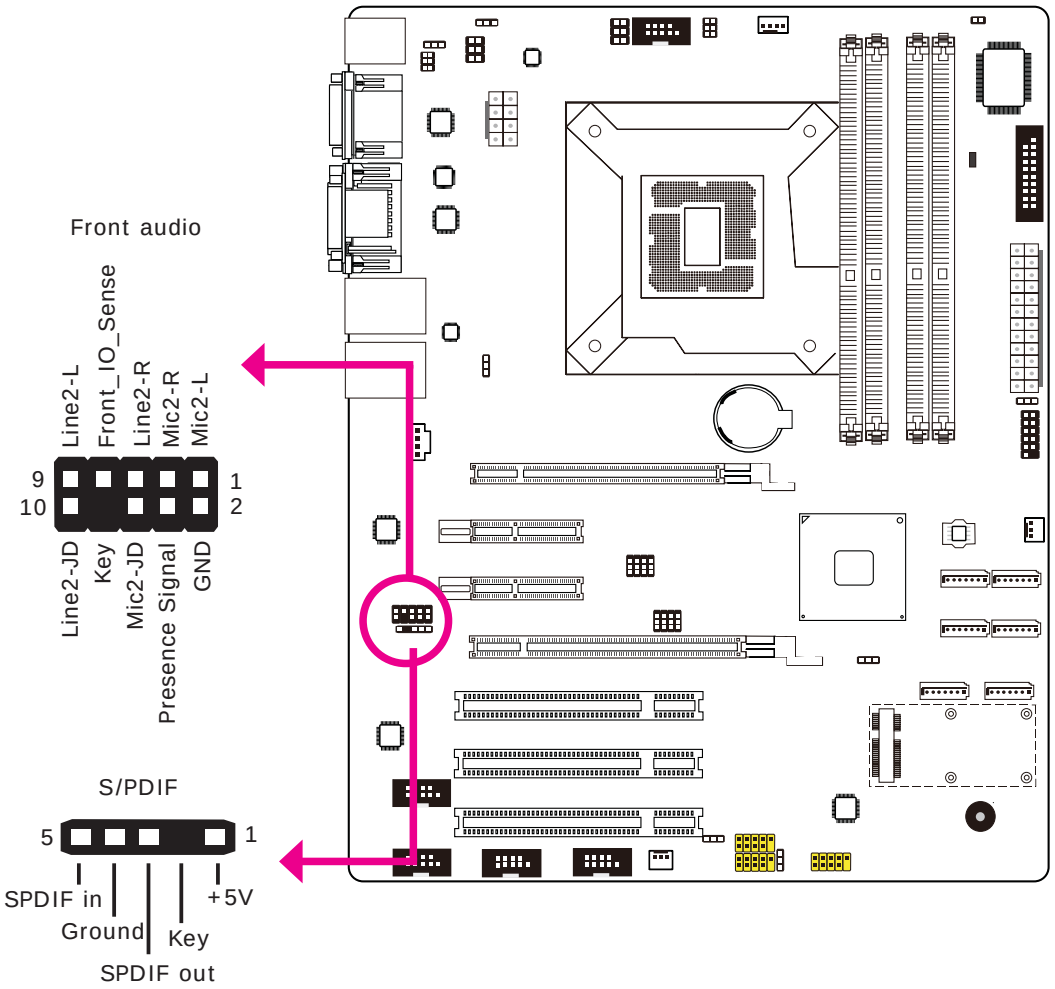
- Jumper Setting

  JP4, JP5, JP9 and/or JP11 must be set to "2-3 On: 5V_standby". Refer to "USB Power Select" in this chapter for more information.

Important:
If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the 5V_standby power source of your power supply must support ≥1.5A. For 3 or more USB ports, the 5V_standby power source of your power supply must support ≥2A.

I/O Connectors

S/PDIF Connector and Front audio

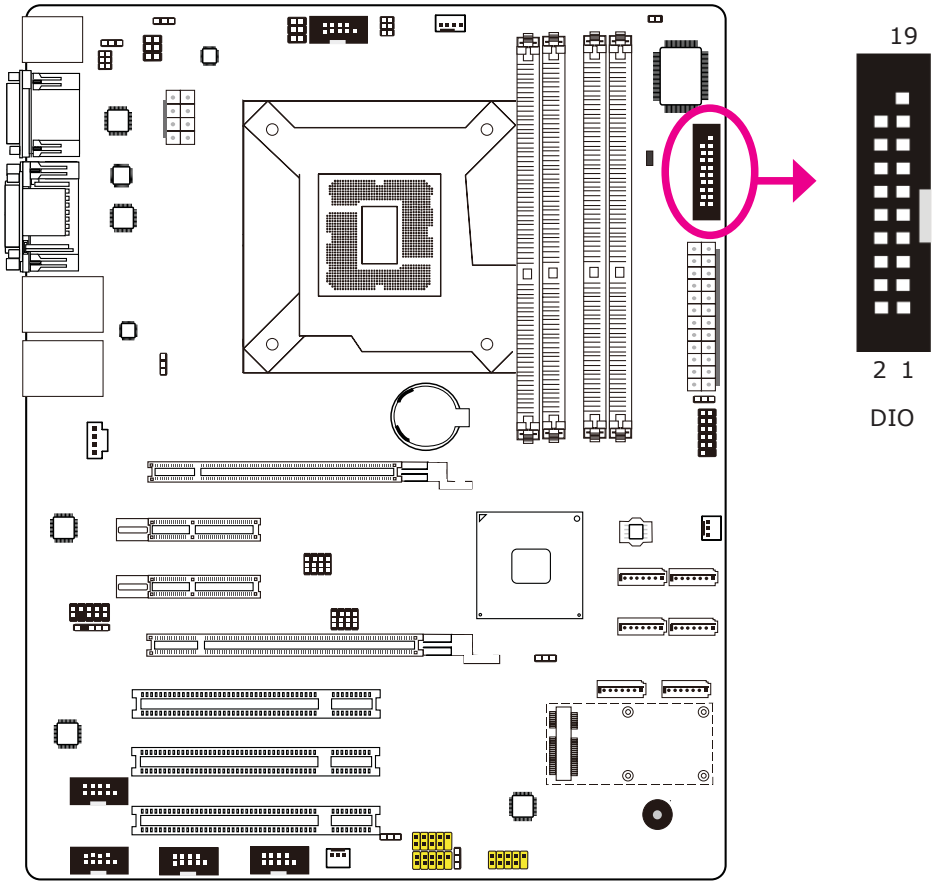


The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned with pin 1 of the S/PDIF connector.

Front Audio

The front audio connector allows you to connect to the second line-out and mic-in jacks that are at the front panel of your system.

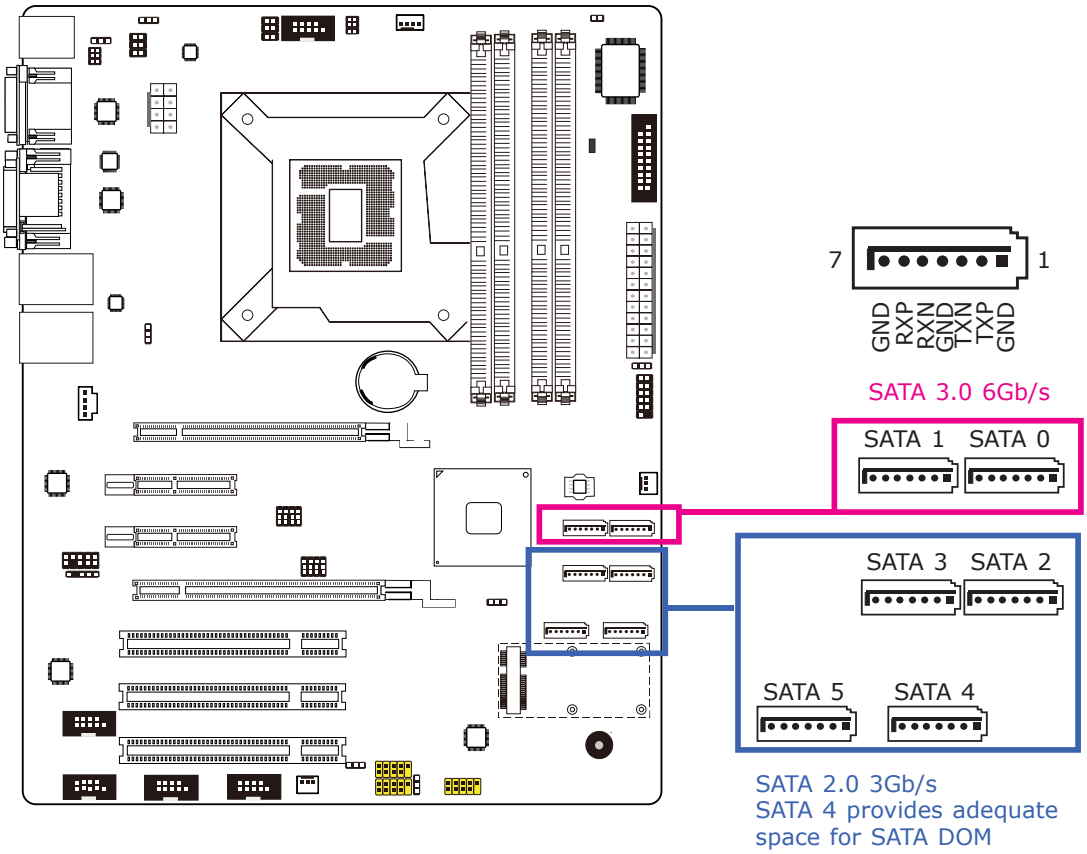
Digital I/O Connectors



The 8-bit Digital I/O connector provides powering-on function to external devices that are connected to these connectors.

Pin	Pin Assignment	Pin	Pin Assignment
1	GND	2	+12V
3	DIO7	4	+12V
5	DIO6	6	GND
7	DIO5	8	VCC
9	DIO4	10	VCC
11	DIO3	12	GND
13	DIO2	14	V_5P0_STBY
15	DIO1	16	V_5P0_STBY
17	DIO0	18	GND
19	GND		

SATA (Serial ATA) Connectors



Features

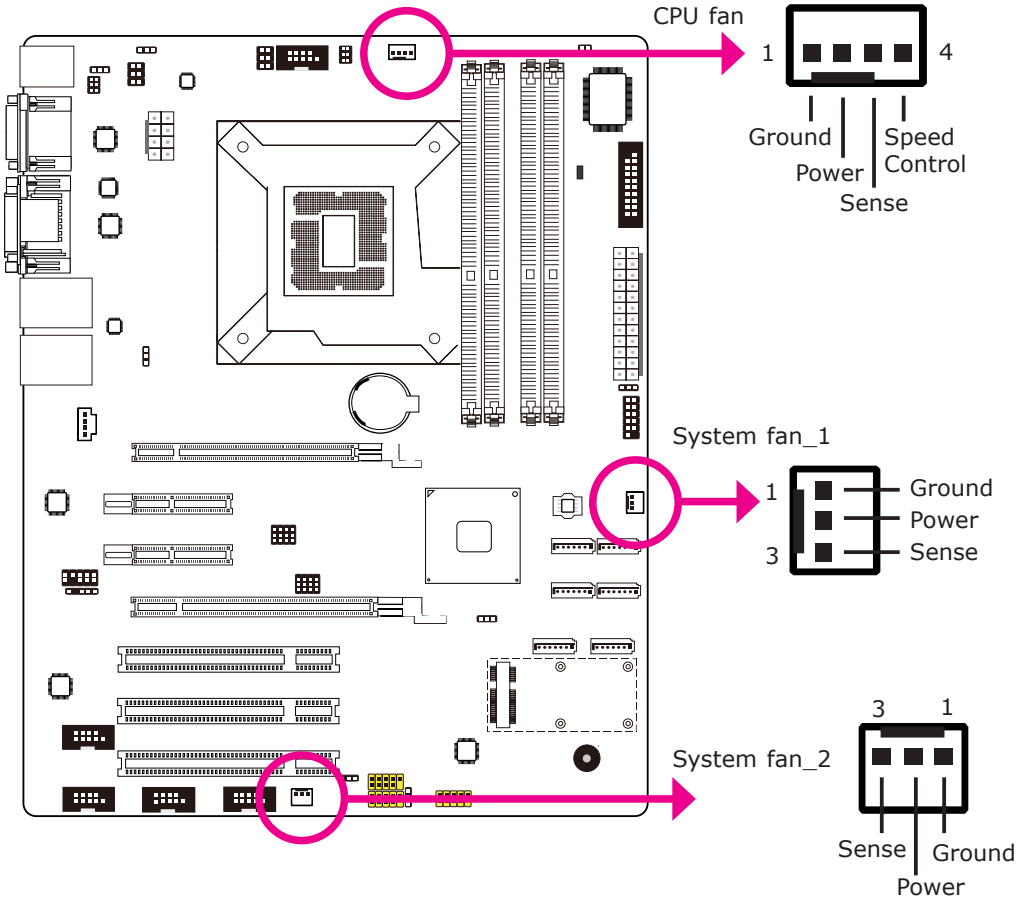
- SATA 0 and SATA 1 support data transfer rate up to 6Gb/s
- SATA 2 to SATA 5 support data transfer rate up to 3Gb/s
  SATA 4 provides adequate space for SATA DOM
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0, RAID 1, RAID 5 and RAID 10

The Serial ATA connectors are used to connect Serial ATA devices. Connect one end of the Serial ATA cable to a SATA connector and the other end to your Serial ATA device.

BIOS Setting

Configure the Serial ATA drives in the Advanced menu ("IDE Configuration" sub-menu) of the BIOS. Refer to chapter 3 for more information.

Cooling Fan Connectors

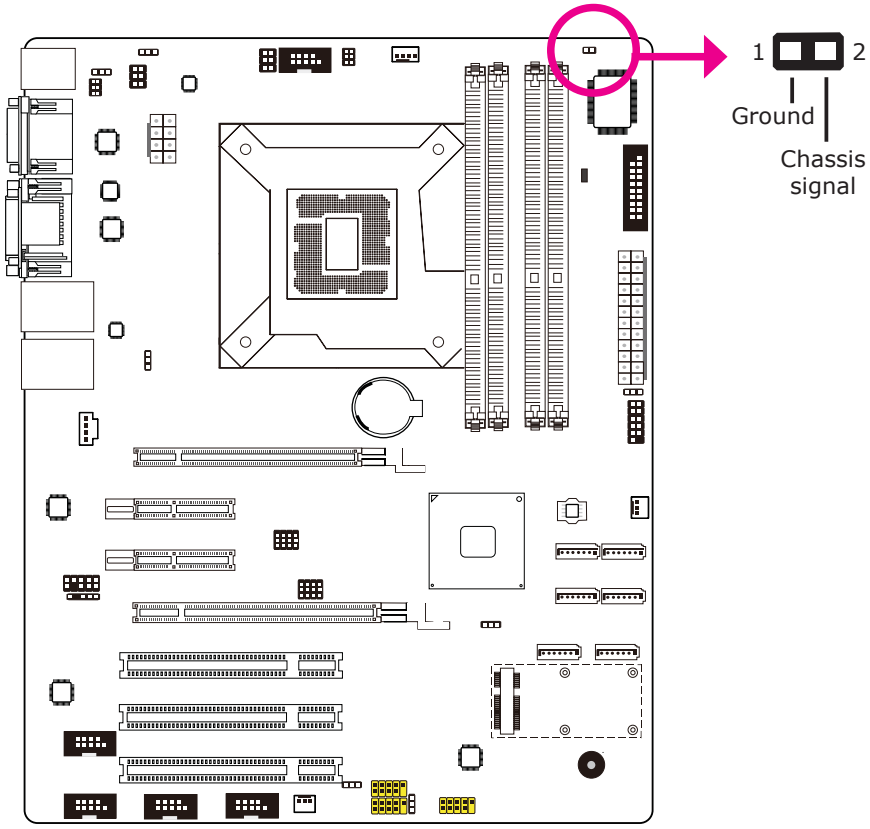


The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

The Advanced menu ("Hardware Health Configuration" submenu) of the BIOS will display the current speed of the cooling fans. Refer to chapter 3 for more information.

Chassis Intrusion Connector

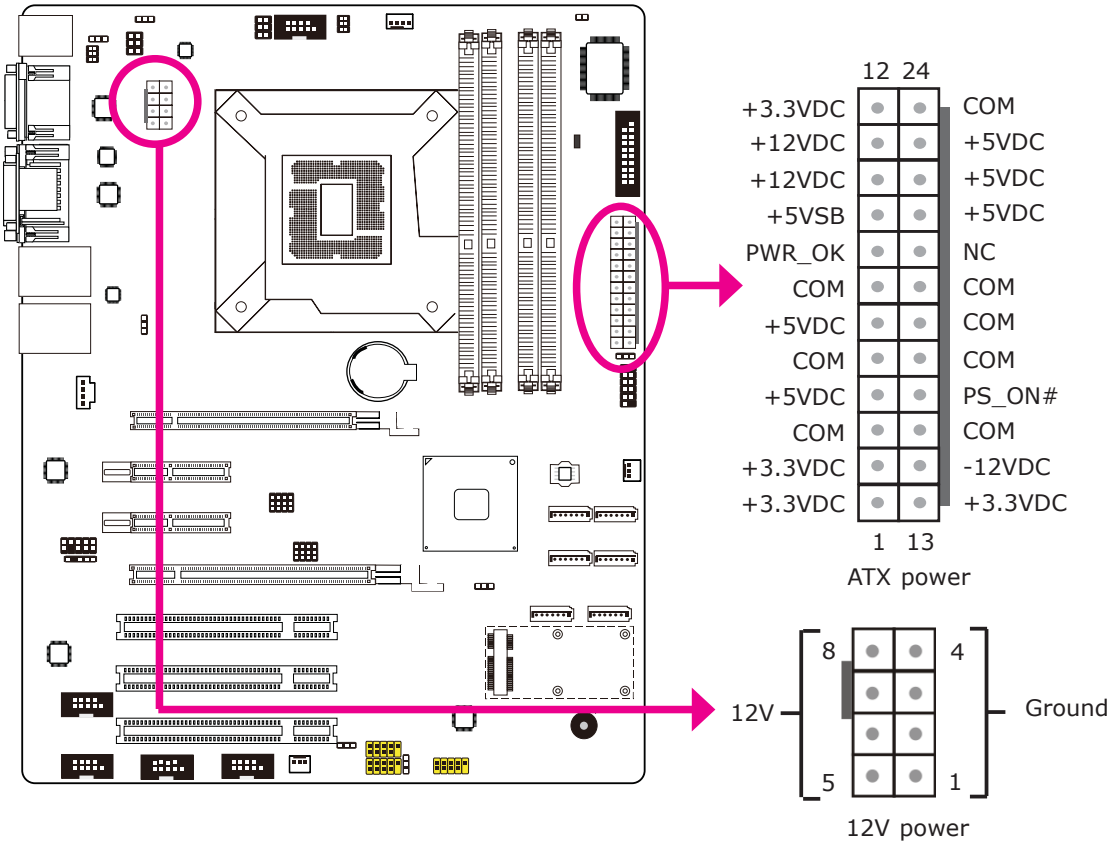


The board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to this connector. When the system's power is on and a chassis intrusion occurred, an alarm will sound. When the system's power is off and a chassis intrusion occurred, the alarm will sound only when the system restarts.

MyGuard Hardware Monitor

Install the "MyGuard Hardware Monitor" utility. By default, the chassis intrusion detection function is disabled. When enabled, a warning message will appear when the chassis is open. The utility can also be configured so that a beeping alarm will sound when the chassis is open. Refer to the "MyGuard Hardware Monitor" section in chapter 4 for more information.

Power Connectors



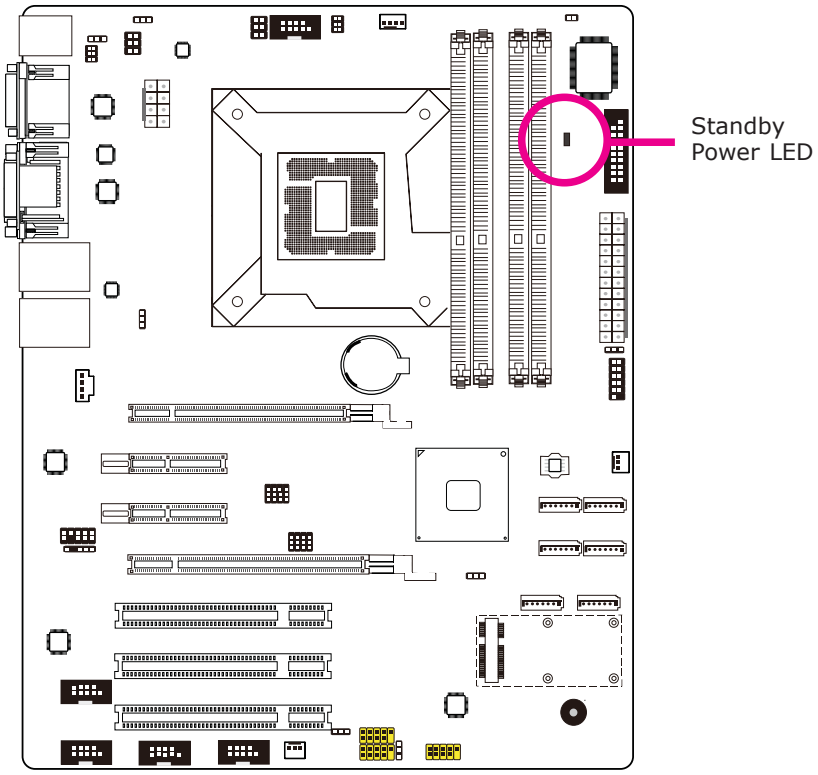
Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector. The 8-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

The power connectors from the power supply unit are designed to fit the 24-pin and 8-pin connectors in only one orientation. Make sure to find the proper orientation before plugging the connectors.

The system board requires a minimum of 300 Watt power supply to operate. Your system configuration (CPU power, amount of memory, add-in cards, peripherals, etc.) may exceed the minimum power requirement. To ensure that adequate power is provided, we strongly recommend that you use a minimum of 400 Watt (or greater) power supply.

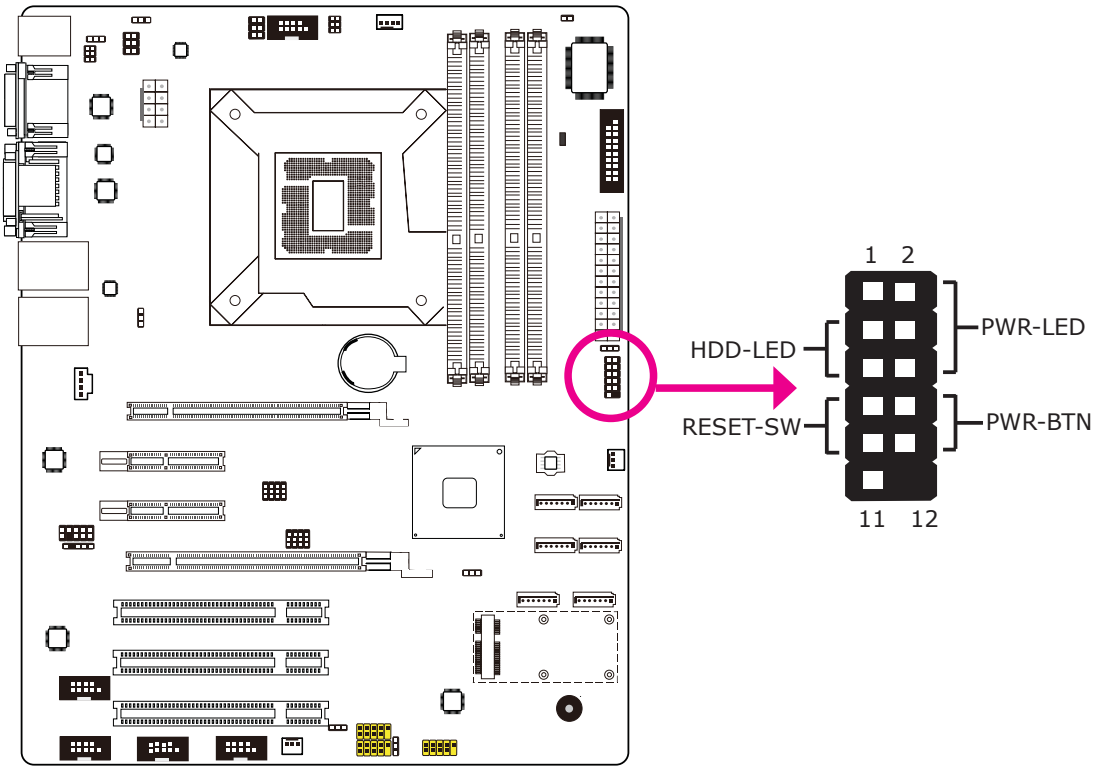
Important:
Insufficient power supplied to the system may result in instability or the add-in boards and peripherals not functioning properly. Calculating the system's approximate power usage is important to ensure that the power supply meets the system's consumption requirements.

Standby Power LED



This LED will light red when the system is in the standby mode. It indicates that there is power on the system board. Power-off the PC and then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.

Front Panel Connectors



HDD-LED - HDD LED

This LED will light when the hard drive is being accessed.

RESET SW - Reset Switch

This switch allows you to reboot without having to power off the system.

PWR-BTN - Power Switch

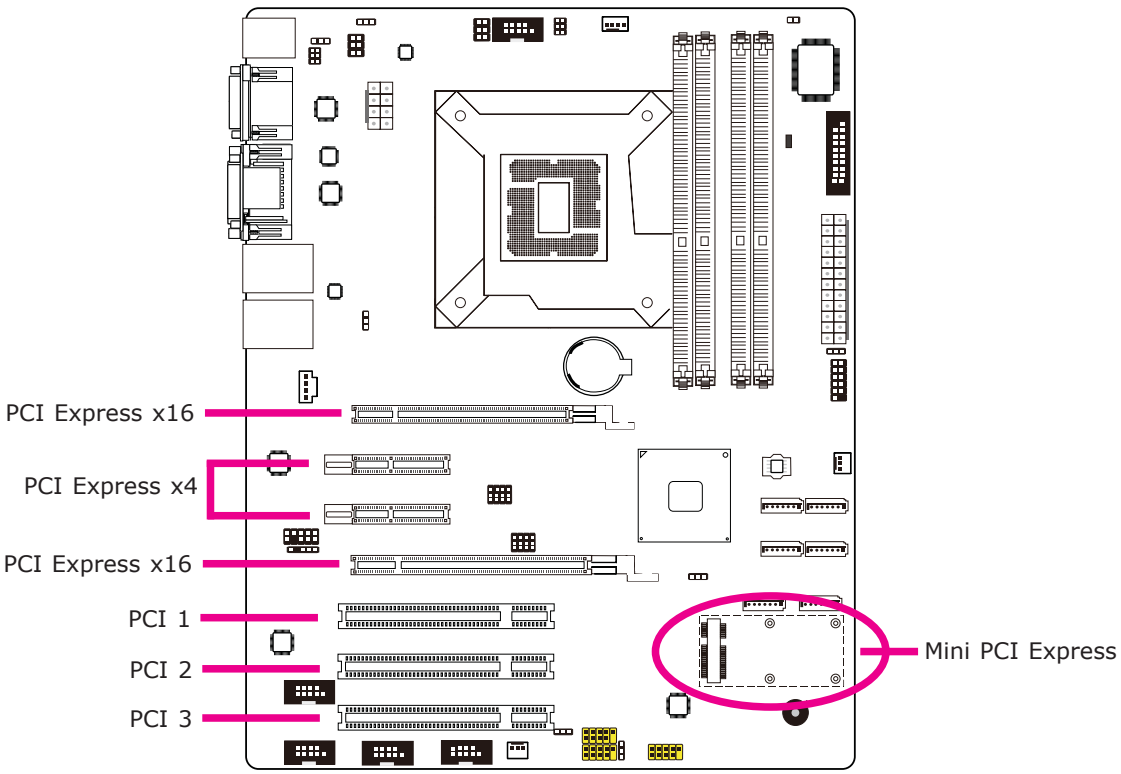
This switch is used to power on or off the system.

PWR-LED - Power/Standby LED

When the system's power is on, this LED will light. When the system is in the S1 (POS - Power On Suspend) state, it will blink every second. When the system is in the S3 (STR - Suspend To RAM) state, it will blink every 4 seconds.

	Pin	Pin Assignment		Pin	Pin Assignment
HDD-LED	3	HDD Power	**PWR-LED**	2	LED Power
	5	Signal		4	LED Power
RESET SW	7	Ground		6	Signal
	9	RST Signal	**PWR-BTN**	8	Ground
	11	N.C.		10	Signal

Expansion Slots



PCI Express x16 Slot

Install PCI Express x16 graphics card, that comply to the PCI Express specifications, into the PCI Express x16 slot. To install a graphics card into the x16 slot, align the graphics card above the slot then press it down firmly until it is completely seated in the slot. The retaining clip of the slot will automatically hold the graphics card in place.

PCI Express x4 Slot

Install PCI Express cards such as network cards or other cards that comply to the PCI Express specifications into the PCI Express x4 slot.

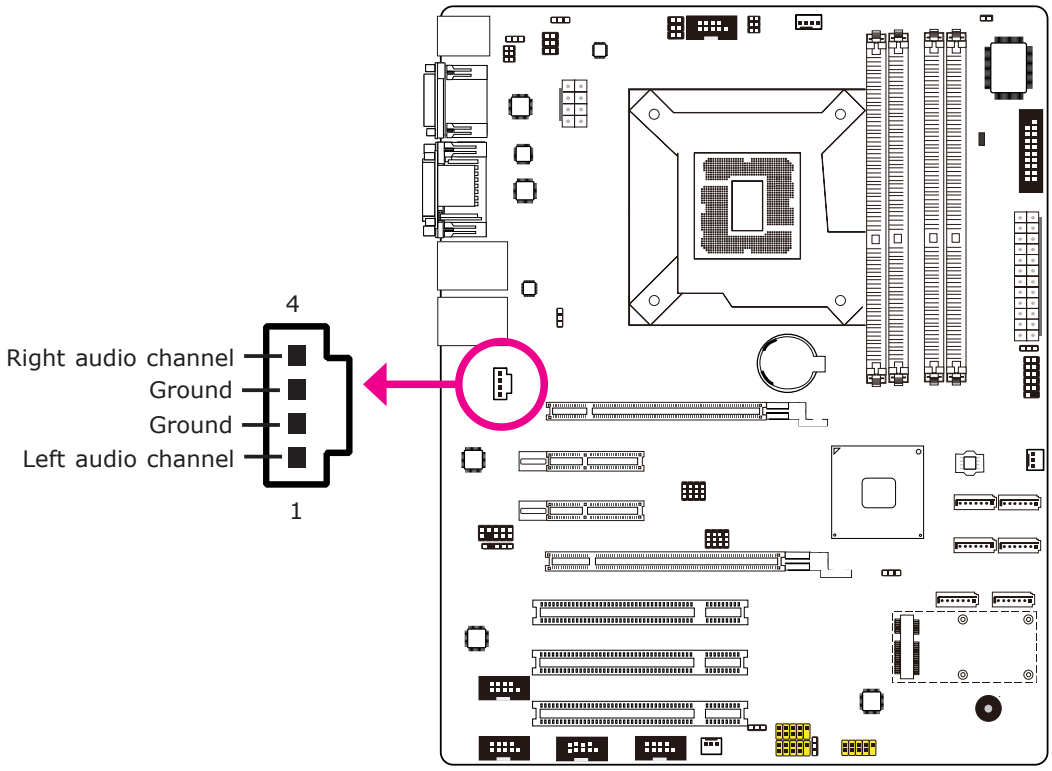
PCI Slots

The PCI slot supports expansion cards that comply with PCI specifications.

Mini PCIe Slot

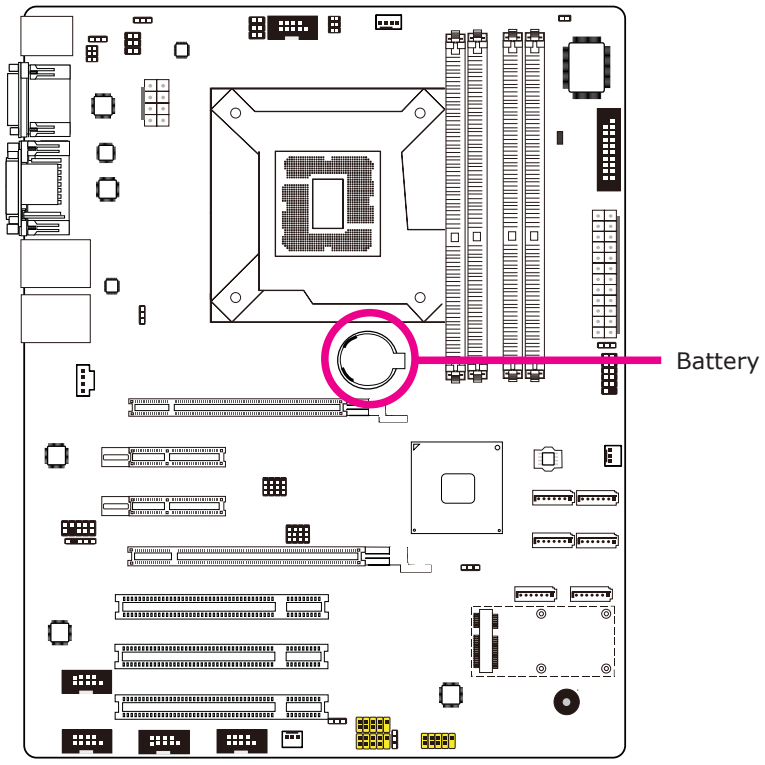
The Mini PCIe socket is used to install a Mini PCIe card. Mini PCIe card is a small form factor PCI card with the same signal protocol, electrical definitions, and configuration definitions as the conventional PCI.

CD-in Internal Audio Connector



The CD-in connector is used to receive audio from a CD-ROM drive, TV tuner or MPEG card.

Battery



The lithium ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.

Safety Measures

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.

Chapter 3 - BIOS Setup

Overview

The BIOS is a program that takes care of the basic level of communication between the CPU and peripherals. It contains codes for various advanced features found in this system board. The BIOS allows you to configure the system and save the configuration in a battery-backed CMOS so that the data retains even when the power is off. In general, the information stored in the CMOS RAM of the EEPROM will stay unchanged unless a configuration change has been made such as a hard drive replaced or a device added.

It is possible that the CMOS battery will fail causing CMOS data loss. If this happens, you need to install a new CMOS battery and reconfigure the BIOS settings.

Note:
The BIOS is constantly updated to improve the performance of the system board; therefore the BIOS screens in this chapter may not appear the same as the actual one. These screens are for reference purpose only.

Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering the BIOS Setup Utility

The BIOS Setup Utility can only be operated from the keyboard and all commands are keyboard commands. The commands are available at the right side of each setup screen.

The BIOS Setup Utility does not require an operating system to run. After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the message “Press DEL to run setup” will appear on the screen. If the message disappears before you respond, restart the system or press the “Reset” button. You may also restart the system by pressing the <Ctrl> <Alt> and <Del> keys simultaneously.

Legends

Keys	Function
Right and Left arrows	Moves the highlight left or right to select a menu.
Up and Down arrows	Moves the highlight up or down between submenus or fields.
<Esc>	Exits to the BIOS Setup Utility.
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
<F1>	Displays General Help.
<F4>	Saves and exits the Setup program.
<Enter>	Press <Enter> to enter the highlighted submenu.

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

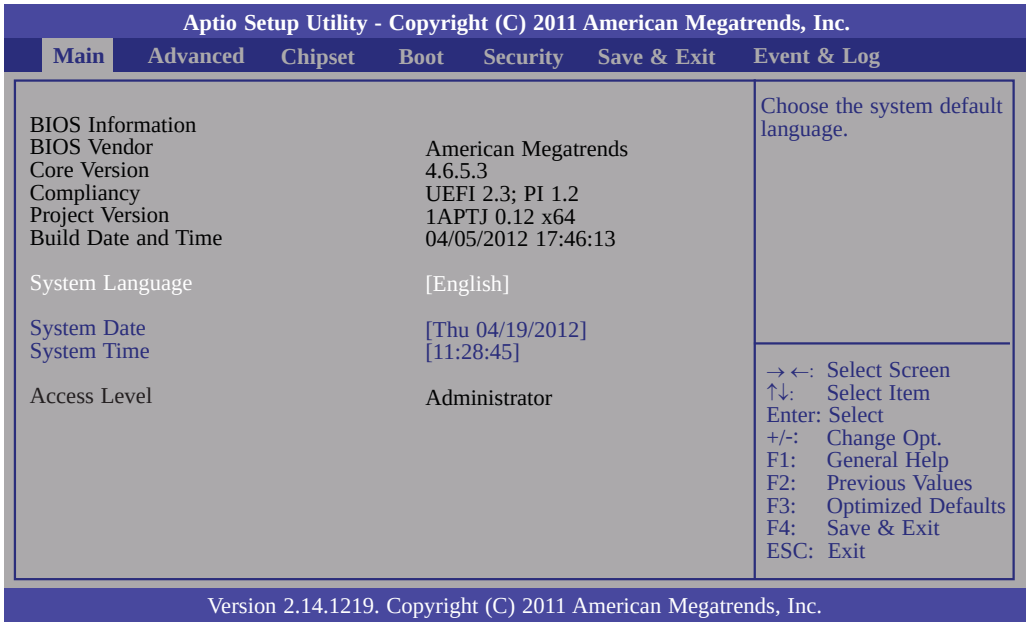
Submenu

When "▸" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press <Enter>.

AMI BIOS Setup Utility

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.



System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1980 to 2099.

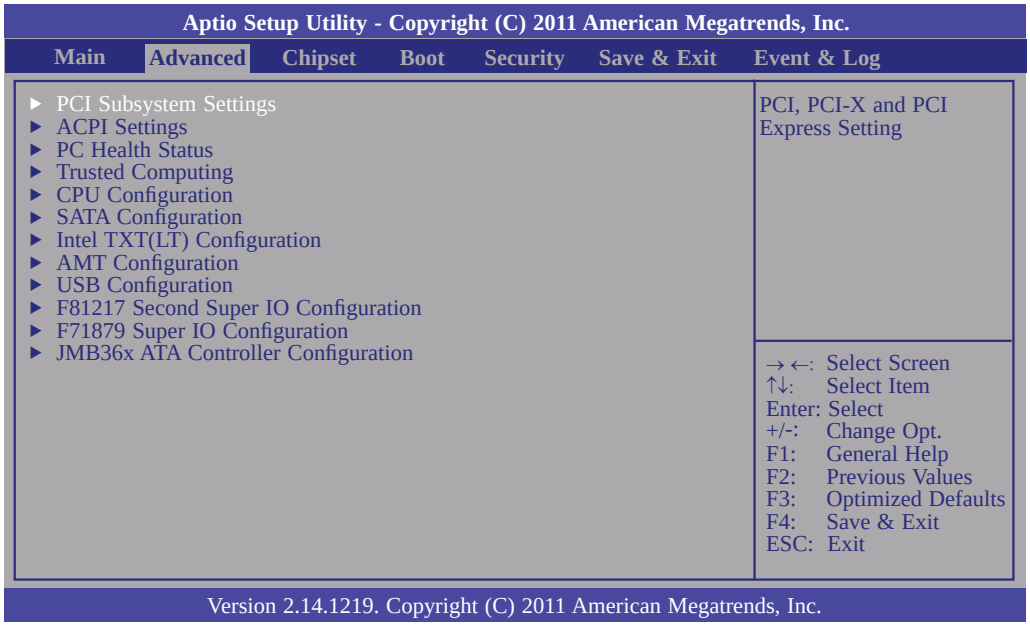
System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

Advanced

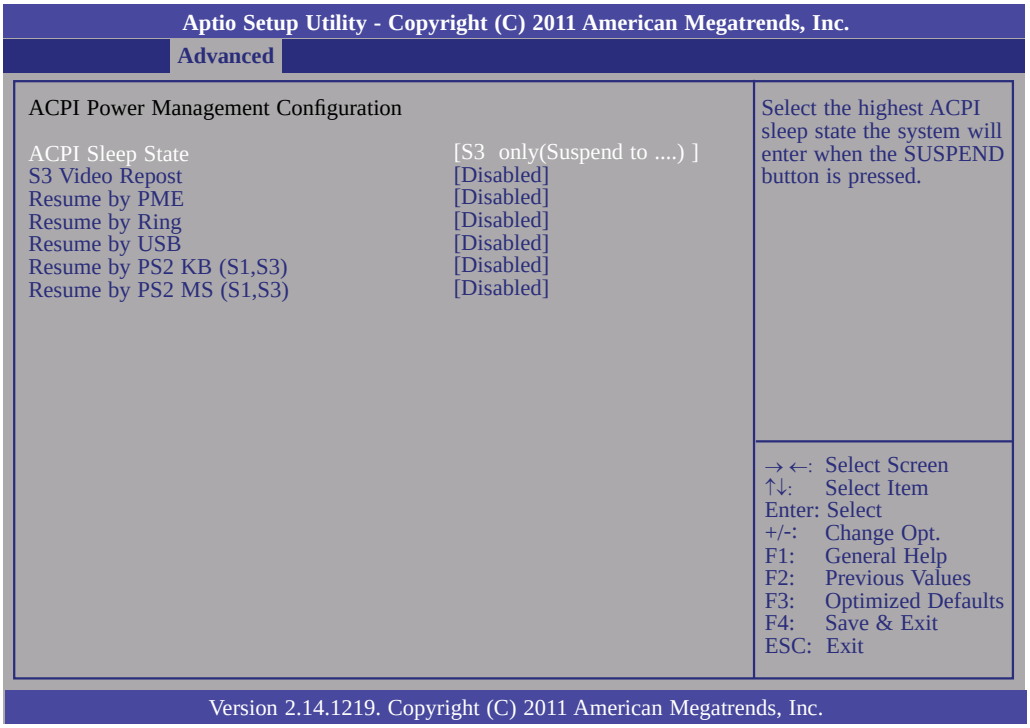
The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Important:
Setting incorrect field values may cause the system to malfunction.



ACPI Power Management Configuration

This section is used to configure the ACPI Power Management.


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced
ACPI Power Management Configuration
ACPI Sleep State [S3 only(Suspend to ....)]
S3 Video Repost [Disabled]
Resume by PME [Disabled]
Resume by Ring [Disabled]
Resume by USB [Disabled]
Resume by PS2 KB (S1,S3) [Disabled]
Resume by PS2 MS (S1,S3) [Disabled]
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

ACPI Sleep State

Selects the highest ACPI sleep state the system will enter when the Suspend button is pressed.

S1(POS) Enables the Power On Suspend function.

S3(STR) Enables the Suspend to RAM function.

S3 Video Repost

When this field is set to Enabled, the system will initialize the VGA BIOS when it wakes up from the S3 state.

Resume by PME

Enable this field to use the PME signal to wake up the system.

Resume by Ring

Set this field to Enabled to use the modem ring-on function. This will allow your system to power-on to respond to calls coming through an external or internal modem.

Resume by USB

About resume by USB; Options are enabled or disabled.

Resume by PS2 KB (S1, S3)

About resume by PS2 KB (S1, S3); Options are enabled or disabled.

Resume by PS2 MS (S1, S3)

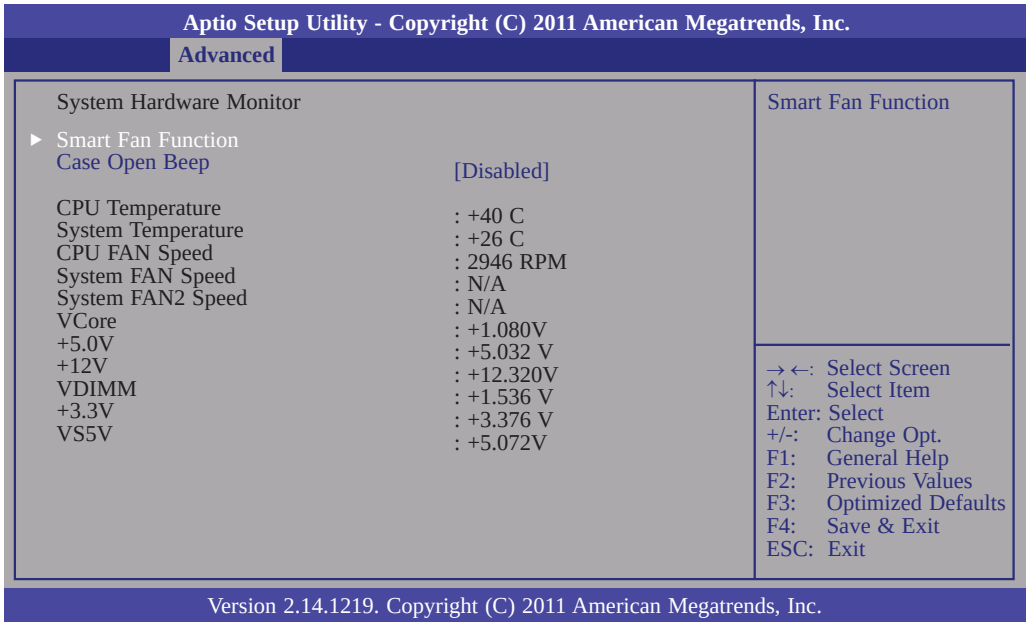
About resume by PS2 MS (S1, S3); Options are enabled or disabled.

Wake system with Fixed Time

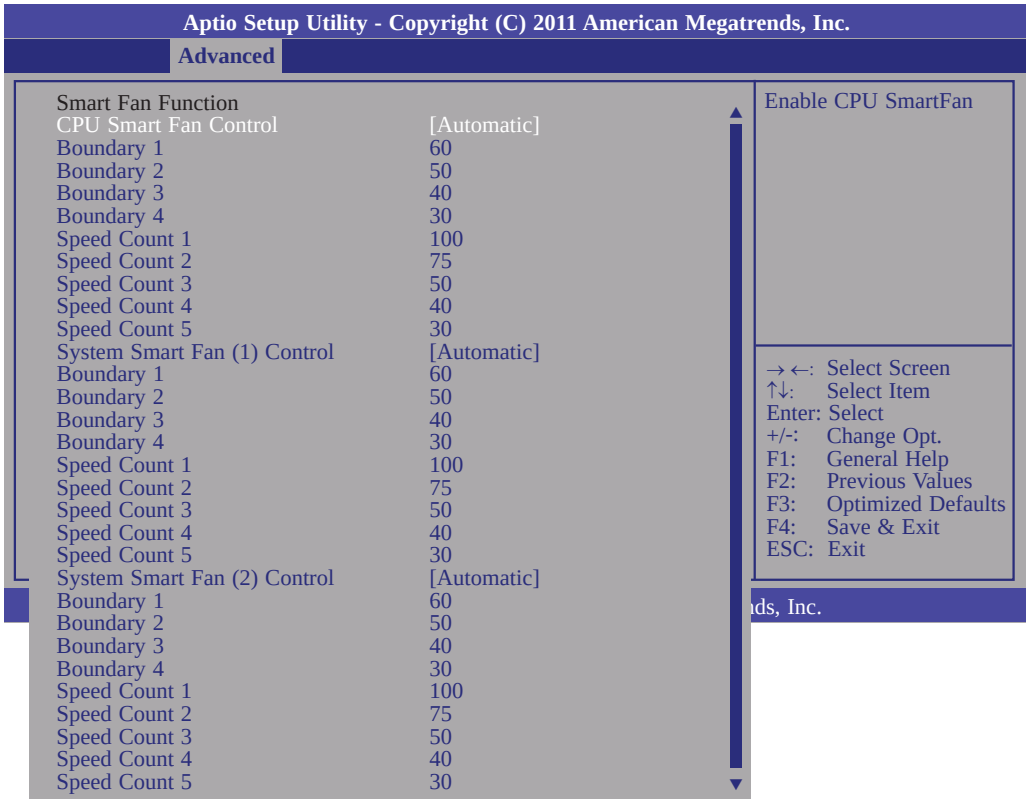
Enable or disable the system wake on alarm event. When enabled, system will wake on the hr::min::sec specified.

PC Health Status

This section displays the SIO hardware health monitor.



Smart Fan Function



CPU Smart Fan Control

When this feature is set to Automatic, the CPU's fan speed will rotate according to the CPU's temperature. The higher the temperature, the faster the speed of rotation.

Boundary 1 to Boundary 4

The range is from 0-127.

Speed Count 1 to Speed Count 5

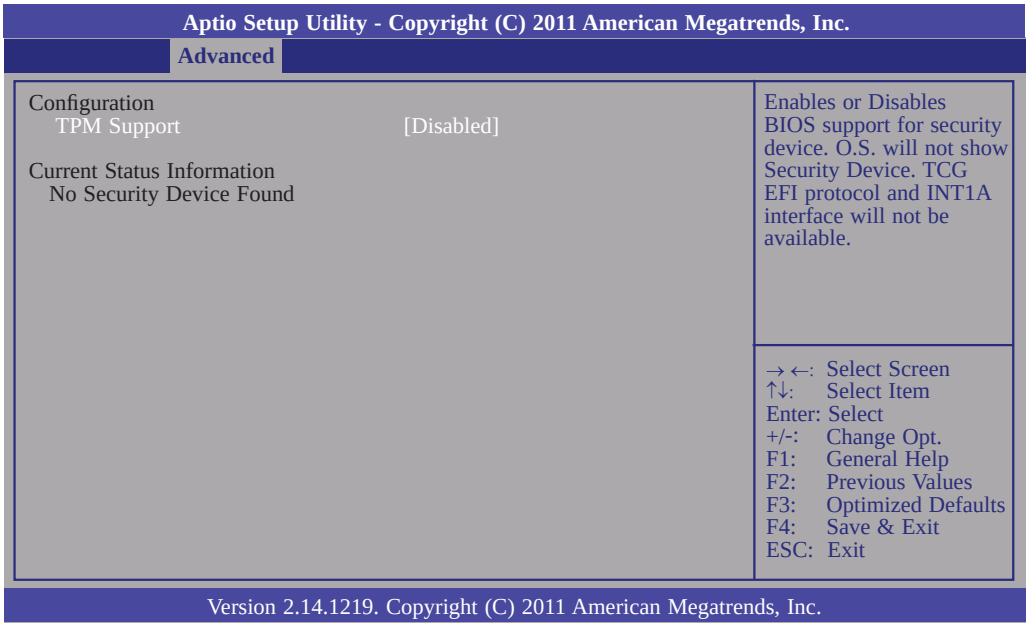
The range is from 1-100.

Case Open Beep

Set this field to Enabled to allow the system to alert you of a chassis intrusion event.

Trusted Computing (optional)

This section configures settings relevant to Trusted Computing innovations.

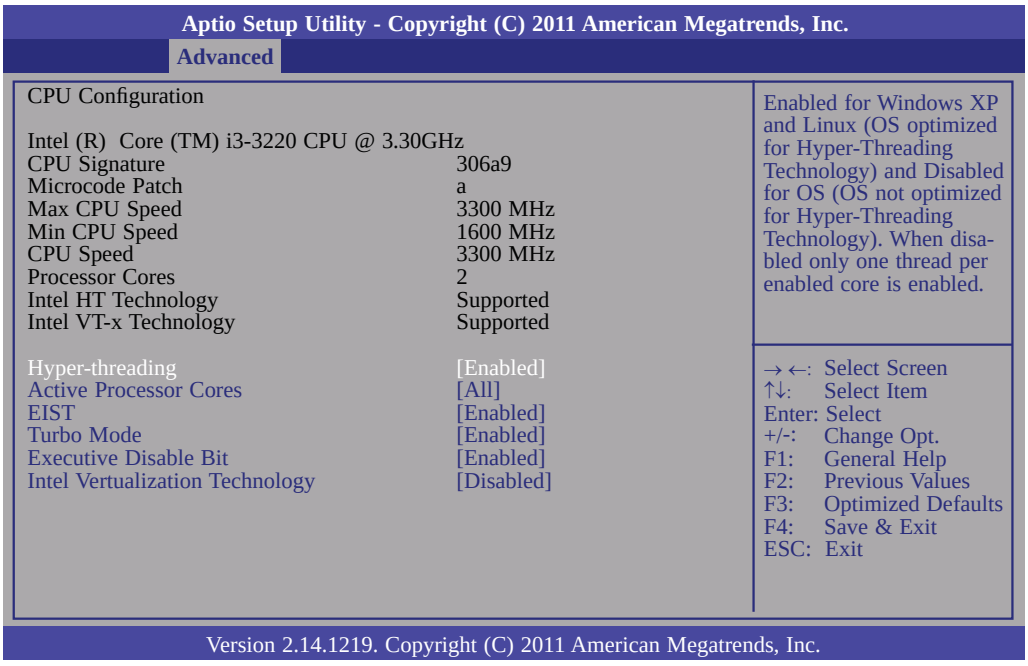

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced
Configuration
TPM Support [Disabled]
Current Status Information
No Security Device Found
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

TPM Support

Enables or Disables TPM. O.S. will not show TPM. Resetting the platform is required.

CPU Configuration

This section is used to configure the CPU. It will also display the detected CPU information.


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced
CPU Configuration
Intel (R) Core (TM) i3-3220 CPU @ 3.30GHz
CPU Signature 306a9
Microcode Patch a
Max CPU Speed 3300 MHz
Min CPU Speed 1600 MHz
CPU Speed 3300 MHz
Processor Cores 2
Intel HT Technology Supported
Intel VT-x Technology Supported
Hyper-threading [Enabled]
Active Processor Cores [All]
EIST [Enabled]
Turbo Mode [Enabled]
Executive Disable Bit [Enabled]
Intel Vertualization Technology [Disabled]
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for OS (OS not optimized for Hyper-Threading Technology). When disabled only one thread per enabled core is enabled.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Hyper-threading

Enable this field for Windows XP and Linux which are optimized for Hyper-Threading technology. Select disabled for other OSes not optimized for Hyper-Threading technology. When disabled, only one thread per enabled core is enabled.

Active Processor Cores

Selects the number of cores to enable in each processor package.

EIST

Enable or disable Intel Speedstep.

Turbo Mode

If you want the system to run at a faster speed, set this field to Enabled. However, compatibility problems may occur with some DRAMs if the system is running in Turbo mode. If you encounter this problem, set this field to Disabled.

Executive Disable Bit

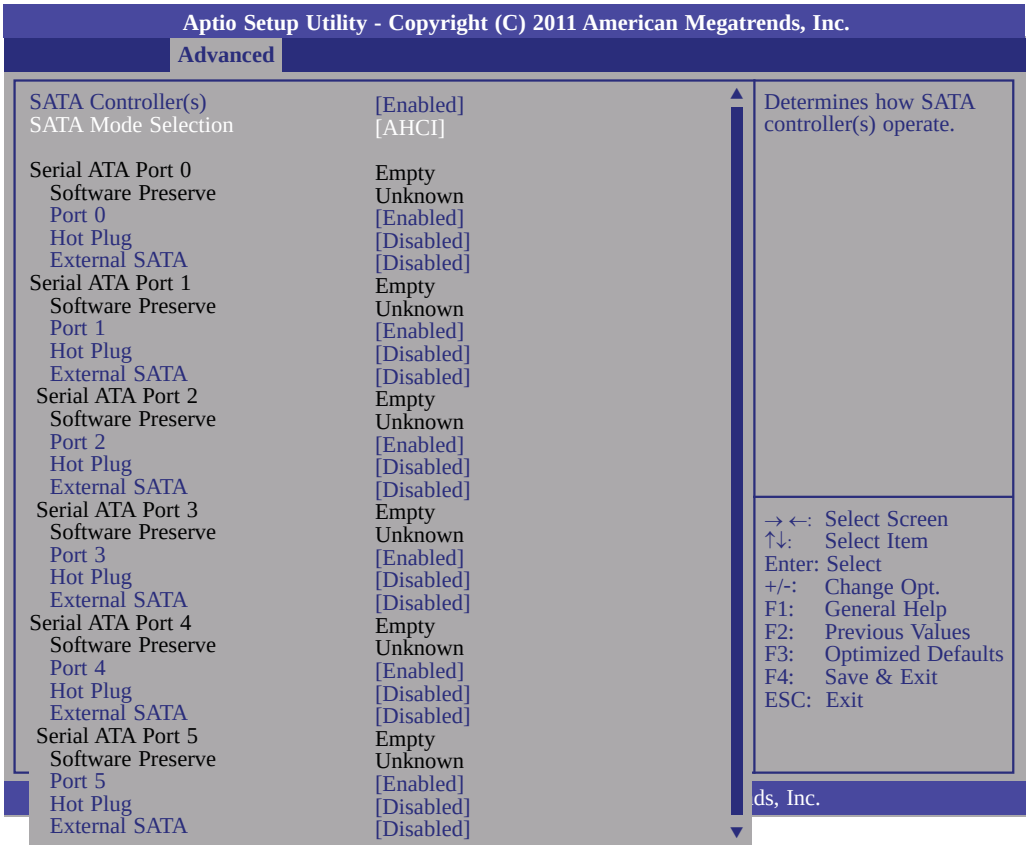
When this field is set to Disabled, it will force the XD feature flag to always return to 0.

Intel Virtualization Technology

When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

SATA Configuration

This section is used to configure SATA functions.



SATA Controller(s)

This field is used to enable or disable the Serial ATA channels.

SATA Mode Selection

AHCI Mode
This option allows the Serial ATA devices to use AHCI (Advanced Host Controller Interface).

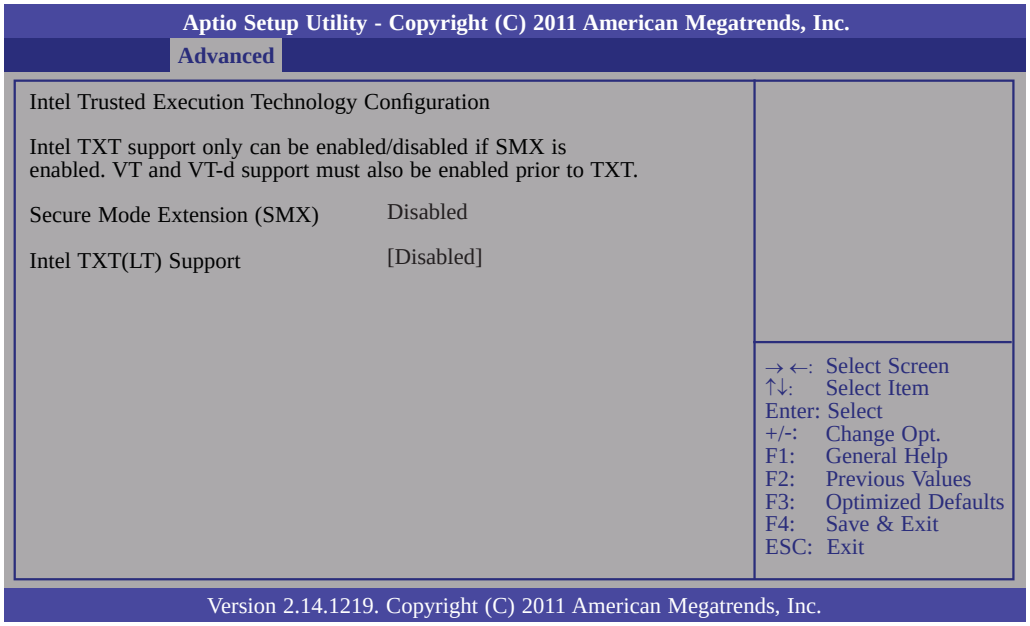
RAID Mode
This option allows you to create RAID or Intel Matrix Storage configuration on Serial ATA devices.

Serial ATA Port 0 to Serial ATA Port 5

These fields are used to configure the connected SATA devices.

Intel TXT (LT) Configuration

This section is used to configure the Intel Trusted Execution technology.


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced
Intel Trusted Execution Technology Configuration
Intel TXT support only can be enabled/disabled if SMX is enabled. VT and VT-d support must also be enabled prior to TXT.
Secure Mode Extension (SMX) Disabled
Intel TXT(LT) Support [Disabled]
→ ←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

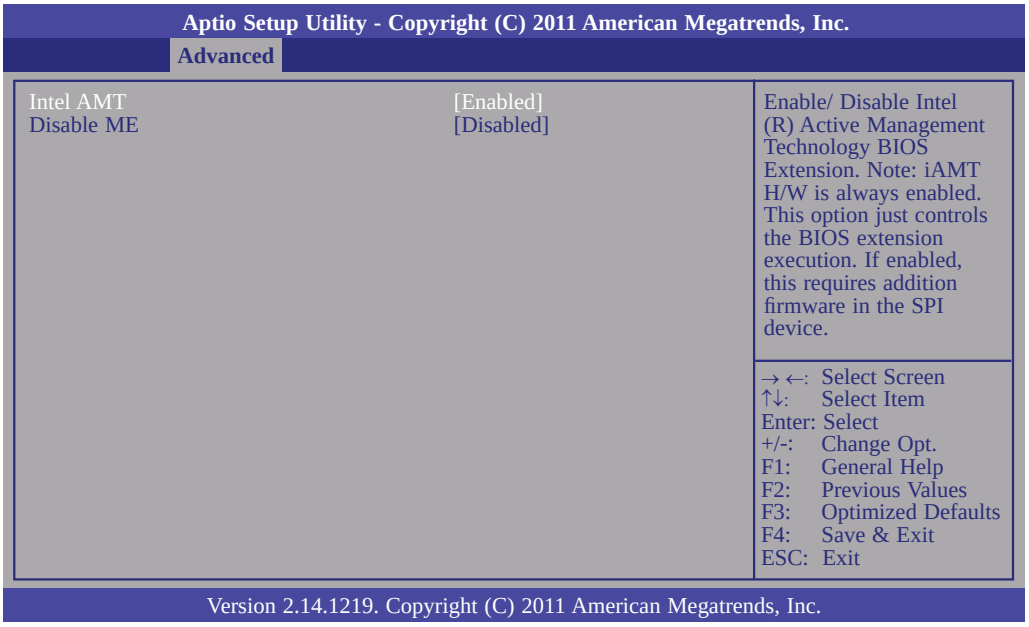
Secure Mode Extensions (SMX)

The options are Enabled and Disabled.

Intel TXT(LT) Support

The options are Enabled and Disabled.

Intel AMT Configuration


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced
Intel AMT
Disable ME
[Enabled]
[Disabled]
Enable/ Disable Intel (R) Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires addition firmware in the SPI device.
→ ←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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Intel AMT

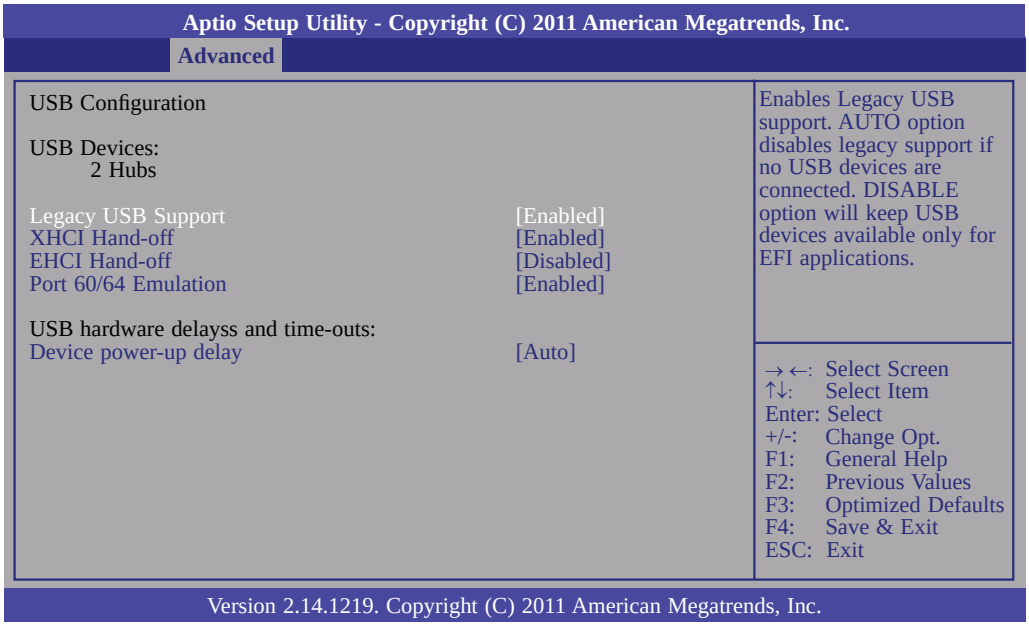
Enables or disables the AMT function.

Disable ME

Set ME to Soft Temperary Disable.

USB Configuration

This section is used to configure USB.


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced
USB Configuration
USB Devices:
2 Hubs
Legacy USB Support [Enabled]
XHCI Hand-off [Enabled]
EHCI Hand-off [Disabled]
Port 60/64 Emulation [Enabled]
USB hardware delayss and time-outs:
Device power-up delay [Auto]
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Legacy USB Support

Enabled
Enables legacy USB.

Auto
Disables support for legacy when no USB devices are connected.

Disabled
Keeps USB devices available only for EFI applications.

XHCI Hand-off

This is a workaround for OSes that does not support XHCI hand-off. The XHCI ownership change should be claimed by the XHCI driver.

EHCI Hand-off

This is a workaround for OSes that does not support EHCI hand-off. The EHCI ownership change should be claimed by the EHCI driver.

Port 60/64 Emulation

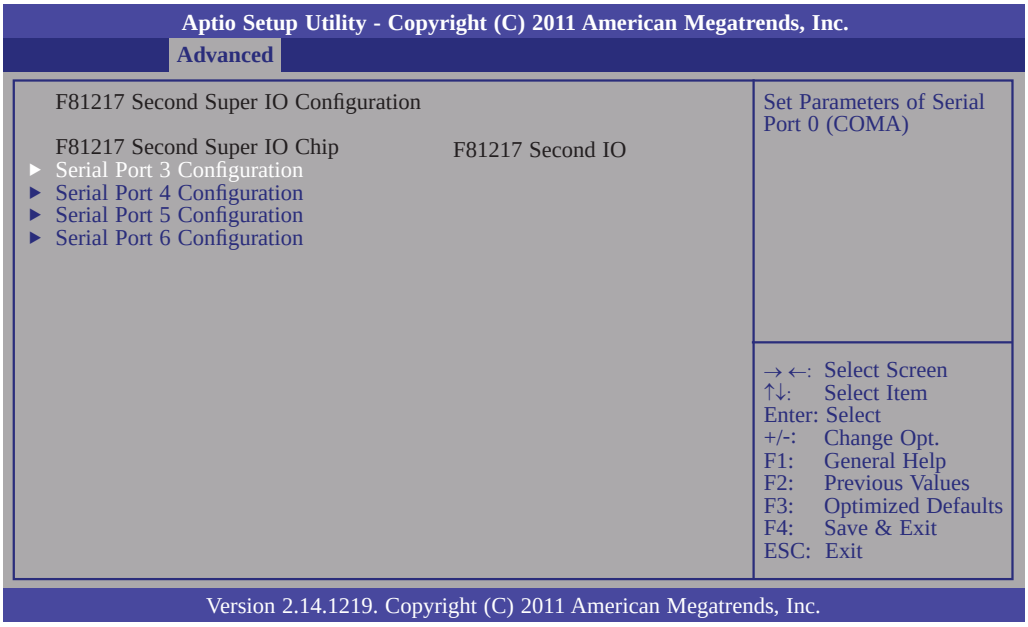
Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

Device power-up delay

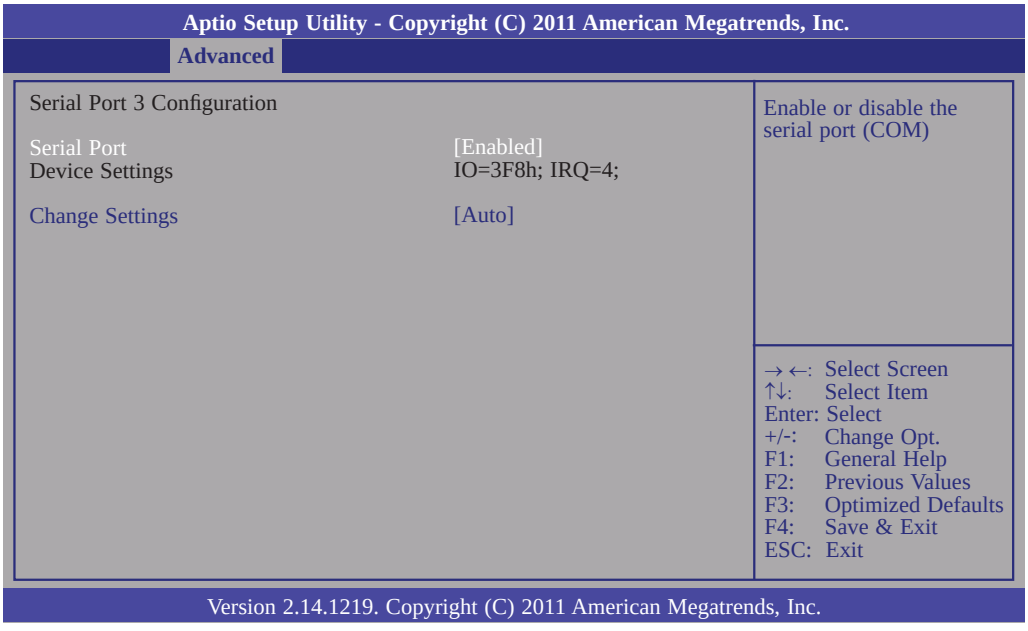
The device will take maximum time before it properly reports itself to controller.

F81217 Second Super IO Configuration

This section is used to configure the serial port functions.


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced
F81217 Second Super IO Configuration
F81217 Second Super IO Chip
F81217 Second IO
Serial Port 3 Configuration
Serial Port 4 Configuration
Serial Port 5 Configuration
Serial Port 6 Configuration
Set Parameters of Serial Port 0 (COMA)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Serial Port 3 Configuration to Serial Port 6 Configuration



Serial Port

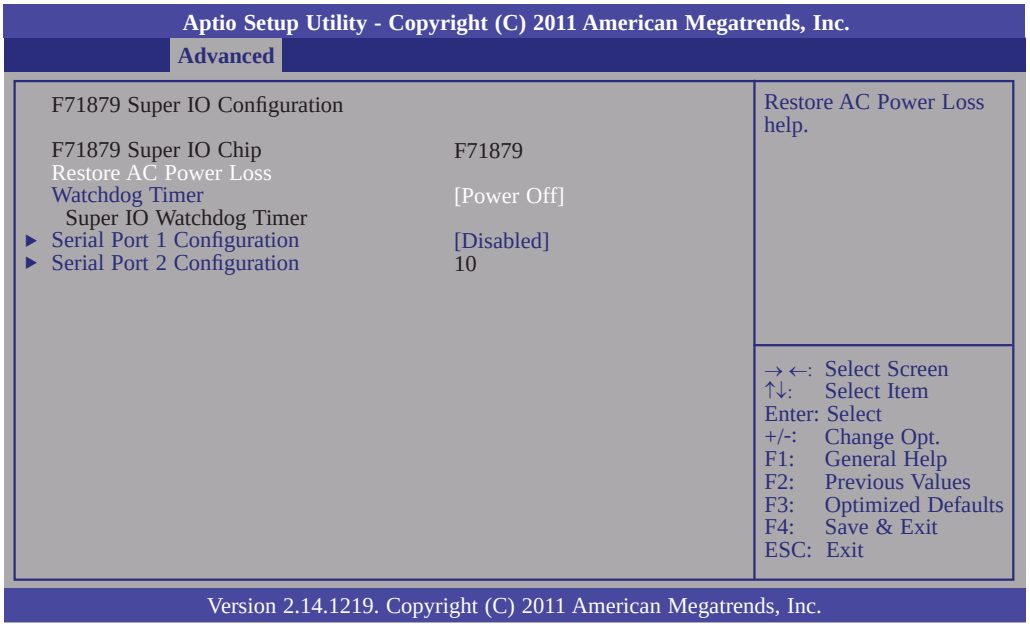
Enables or disables the serial port.

Change Settings

Selects the IO/IRQ setting of the I/O device.

F71879 Super IO Configuration

This section is used to configure the I/O functions supported by the onboard Super I/O chip.


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced
F71879 Super IO Configuration
F71879 Super IO Chip F71879
Restore AC Power Loss
Watchdog Timer [Power Off]
Super IO Watchdog Timer
Serial Port 1 Configuration [Disabled]
Serial Port 2 Configuration 10
Restore AC Power Loss help.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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Restore AC Power Loss

Off
When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.

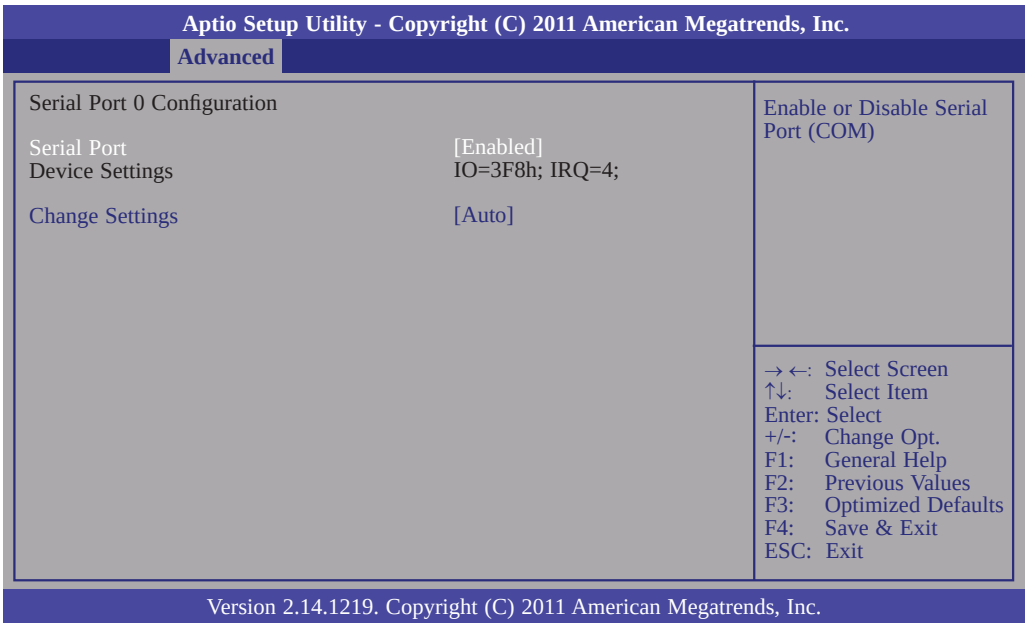
On
When power returns after an AC power failure, the system will automatically power-on.

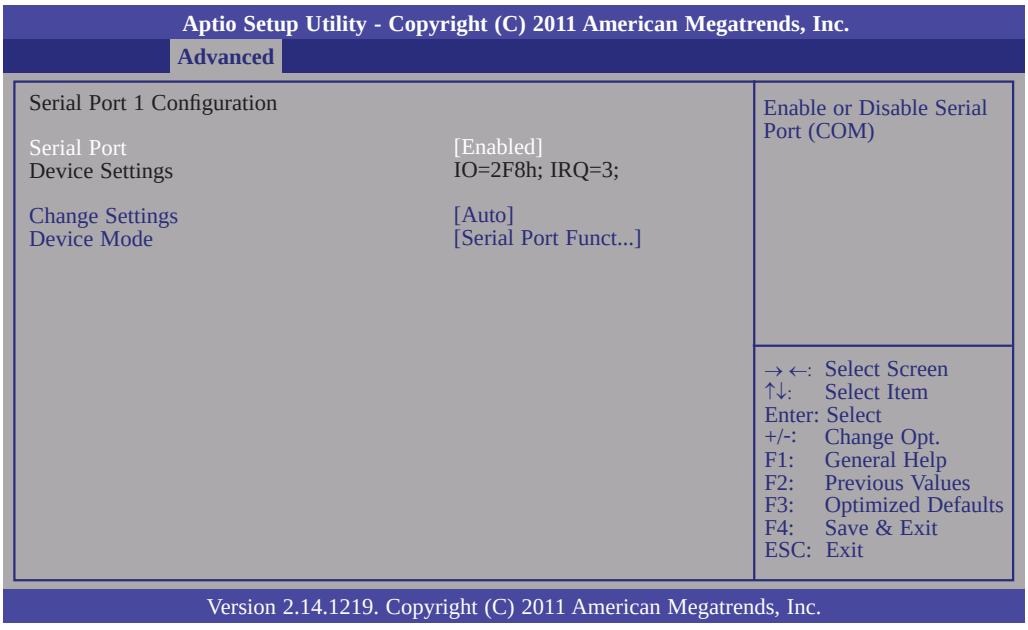
Last State
When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns.

Watchdog Timer

This field is used to select the time interval of the Watchdog timer. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

Serial Port 0 Configuration to Serial Port 1 Configuration





Serial Port

Enables or disables the serial port.

Change Settings

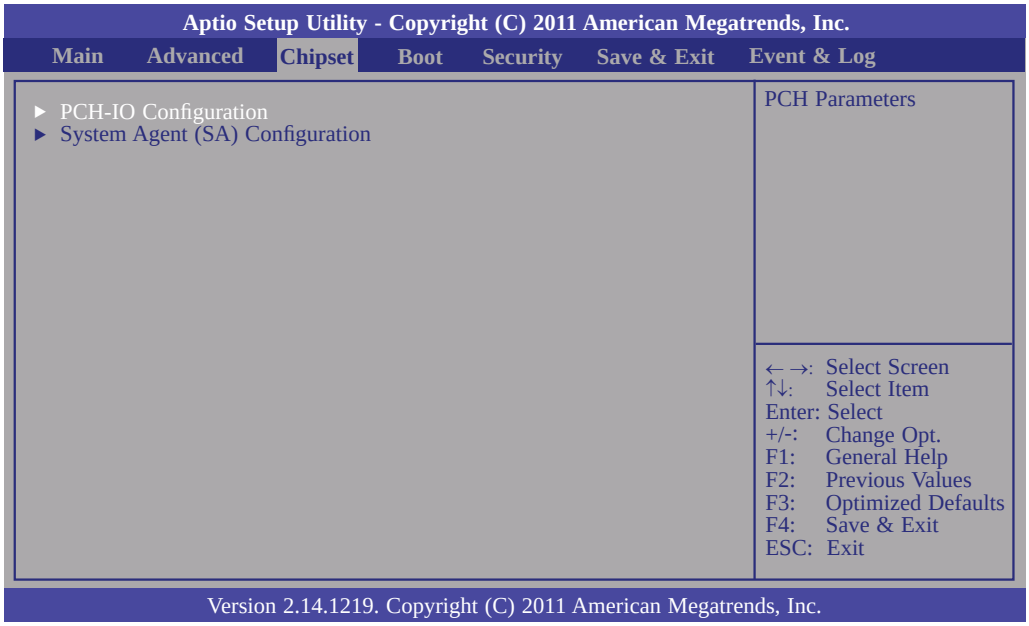
Selects the IO/IRQ setting of the I/O device.

Device Mode

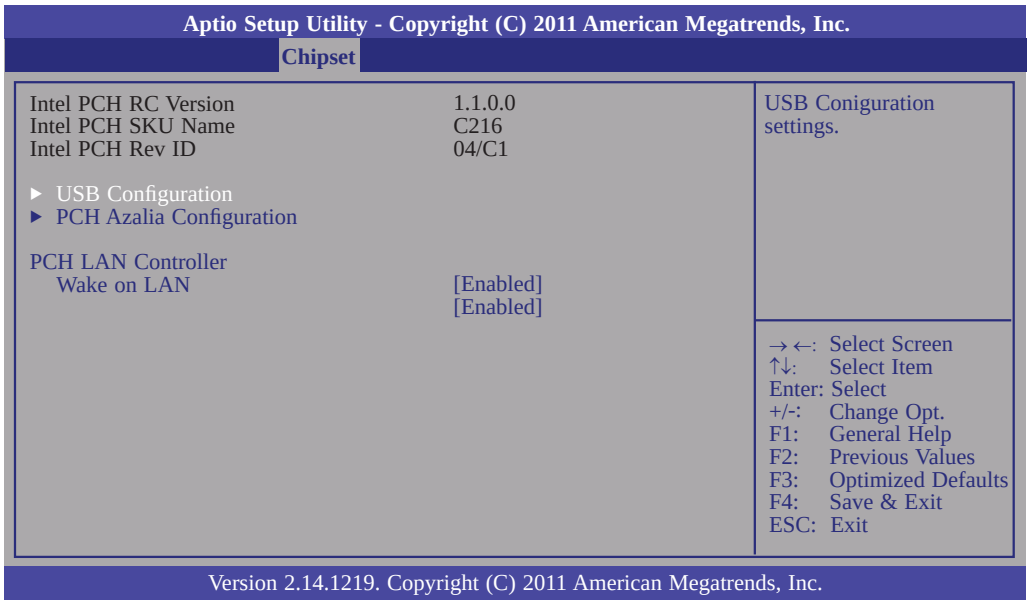
Selects the COM port/ IR device setting of the Super IO.

Chipset

Configures relevant chipset functions.



PCH-IO Configuration



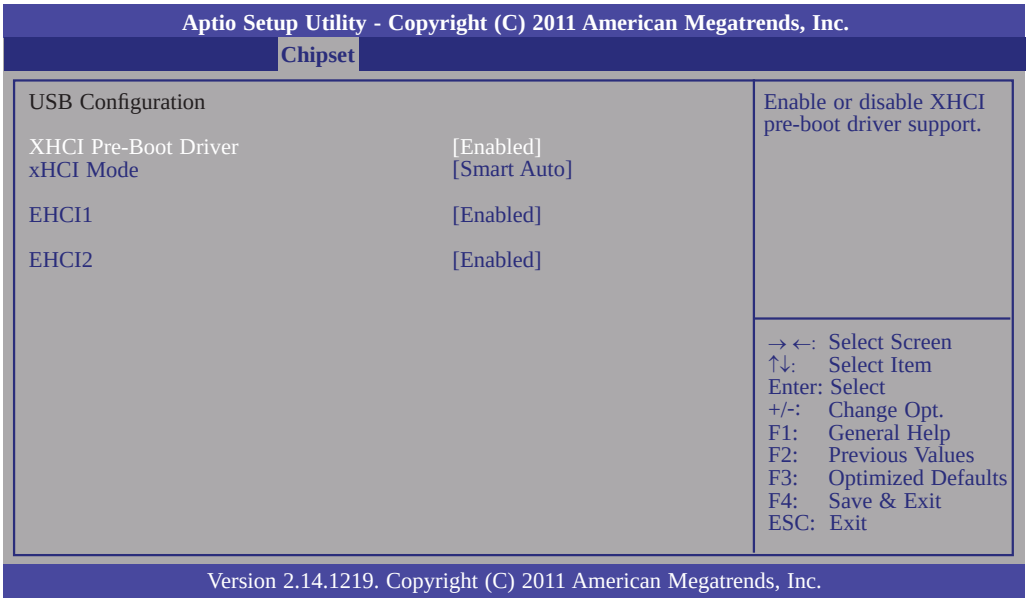
PCH LAN Controller

Enables or disables the PCH LAN Controller.

Wake on LAN Enable

Set this field to Enabled to wake up the system via the onboard LAN or via a LAN card that supports the remote wake up function.

USB Configuration



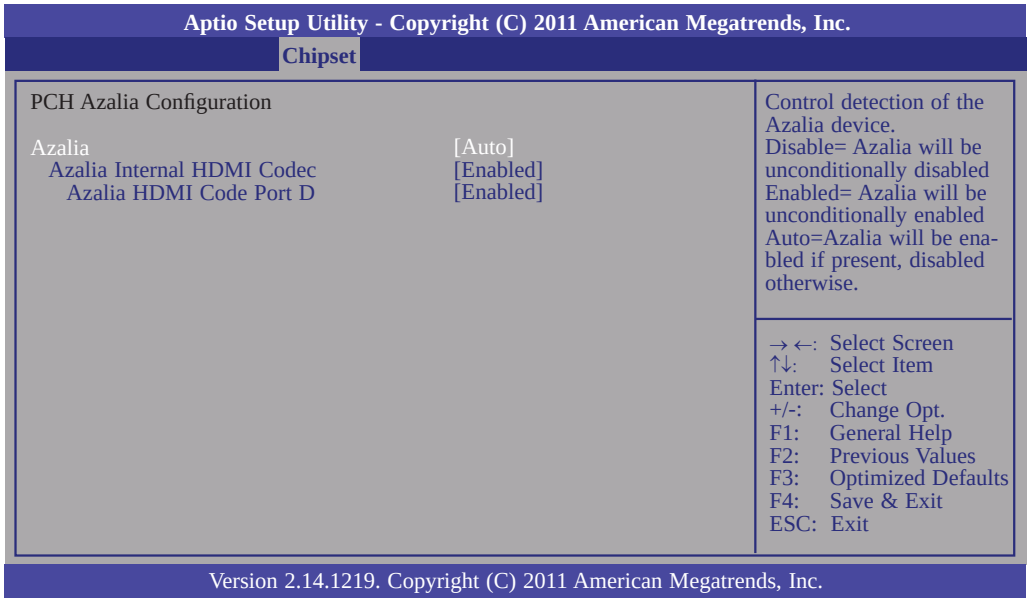
xHCI Mode

Mode of operation of xHCI controller. Options are Smart Auto, Auto, Enabled, Disabled.

EHCI1 and EHCI2

These fields are used to enable or disable USB 2.0.

PCH Azalia Configuration


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Chipset
PCH Azalia Configuration
Azalia [Auto]
Azalia Internal HDMI Codec [Enabled]
Azalia HDMI Code Port D [Enabled]
Control detection of the Azalia device.
Disable= Azalia will be unconditionally disabled
Enabled= Azalia will be unconditionally enabled
Auto=Azalia will be enabled if present, disabled otherwise.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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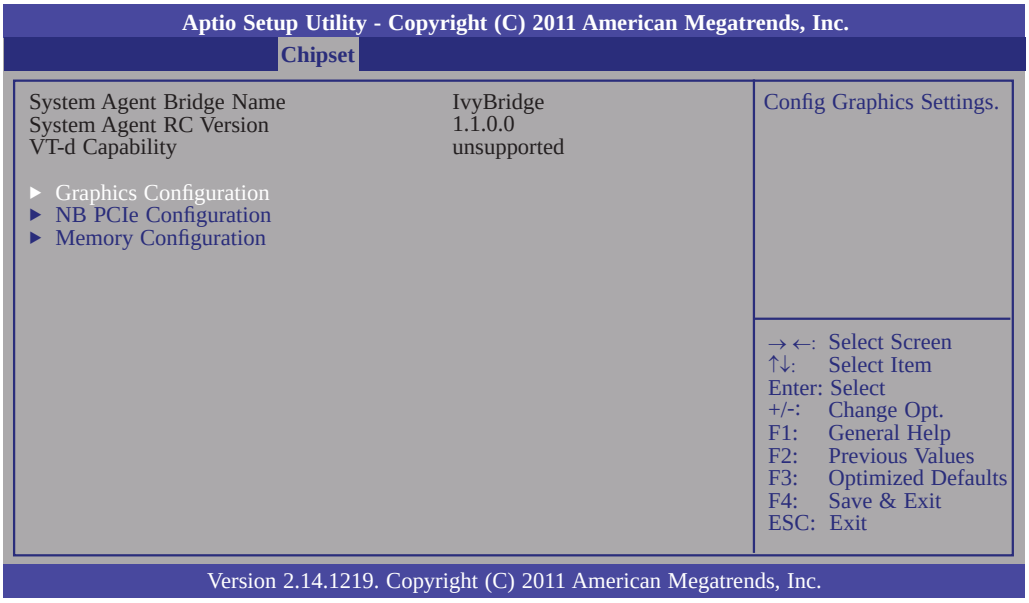
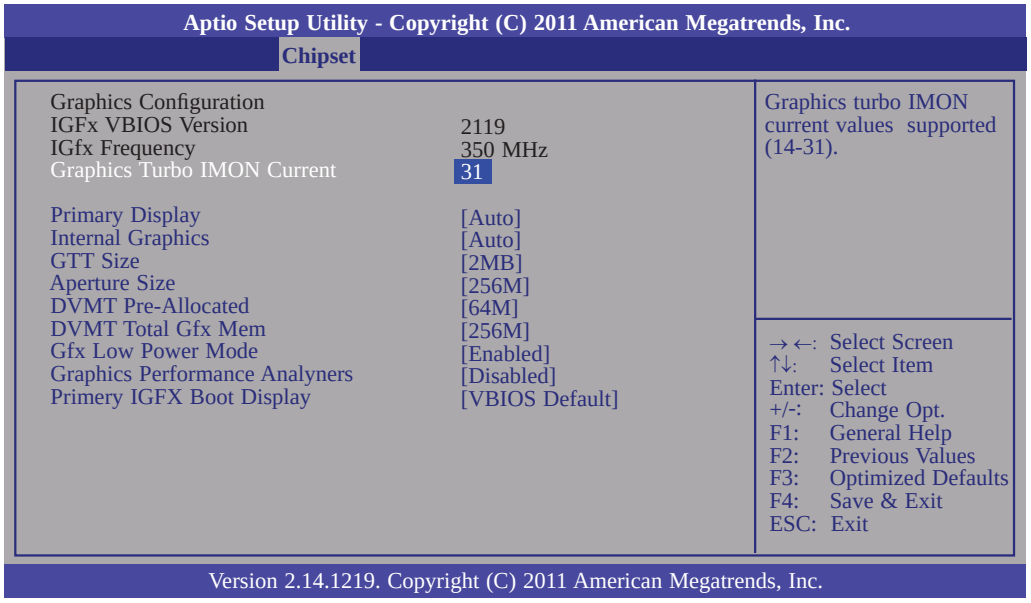
Azalia internal HDMI codec

Enables or disables the Azalia internal HDMI codec.

System Agent (SA) Configuration



Graphics Configuration



Primary Display

Auto	When the system boots, it will auto detects the display device.
IGFX	When the system boots, it will first initialize the onboard VGA.
PEG	When the system boots, it will first initialize the PCI Express x16 graphics card.

Internal Graphics

Keep IGD enabled based on the setup options.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the internal graphics device.

DVMT Total Gfx Memory

Select DVMT 5.0 total Graphics Memory size used by the internal graphics device.

Gfx low power mode

This option is applicable for SFF only.

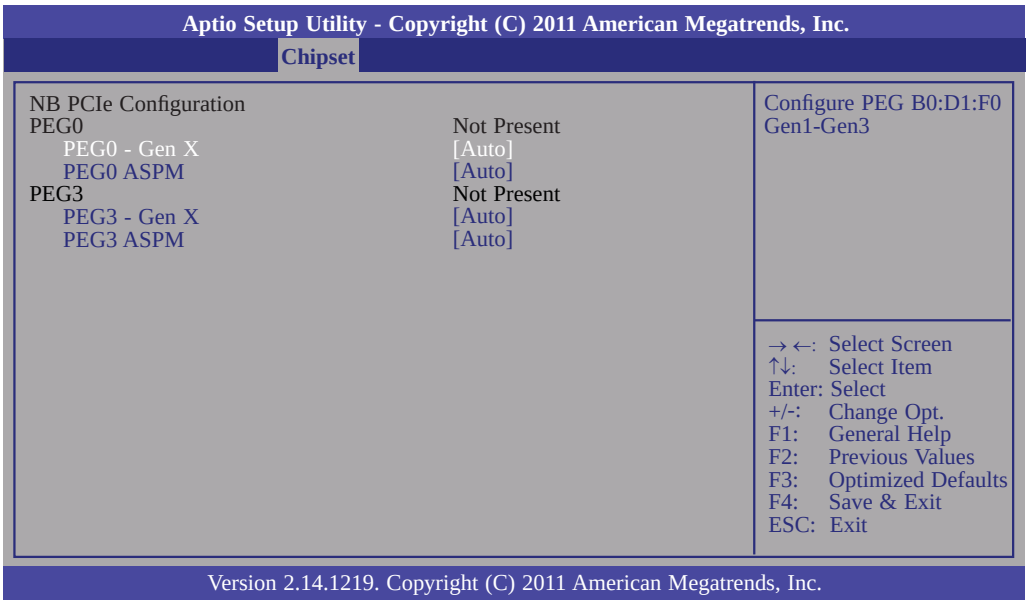
Grafics Performance Analyzers

Enable or Disabel Intel Grafics Performance Analyzers Counters.

Primary IGFX Boot Display

Select the Video device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.

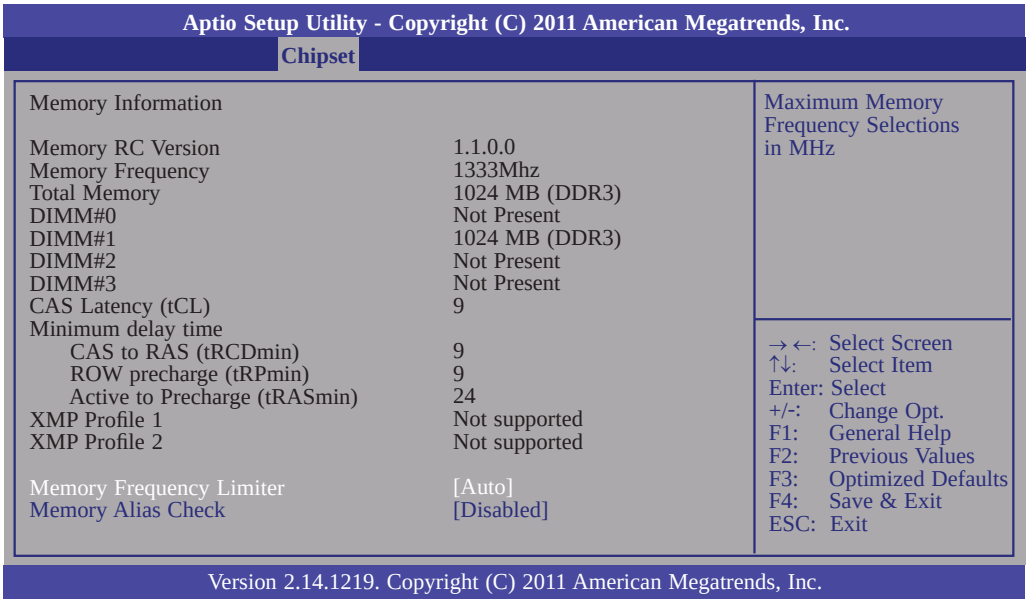
NB PCIe Configuration



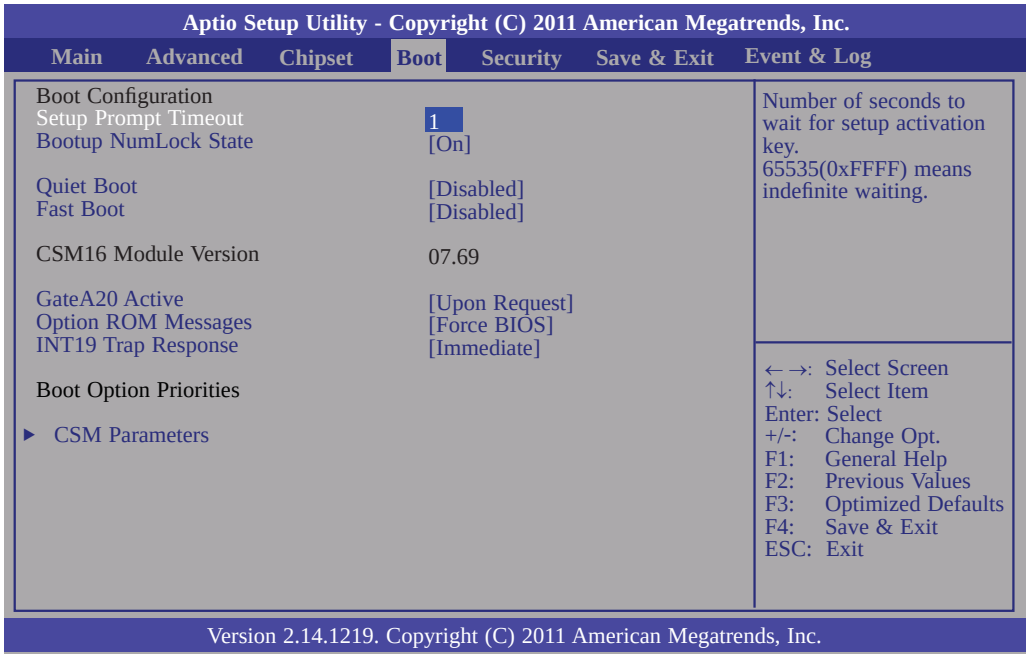
PEG0 ASPM

Control ASPM support for the PEG: Device 1 function 0. This has no effect if PEG is not the currently active device.

Memory Information



Boot



Setup Prompt Timeout

Selects the number of seconds to wait for the setup activation key. 65535(0xFFFF) denotes indefinite waiting.

Bootup NumLock State

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Quiet Boot

Enables or disables the quiet boot function.

Fast Boot

Enables or disables boot with initialization of a minimal set of devices re quired to launch active boot option. Has no effect for BBS boot options.

GateA20 Active

Upon Request- GA20 can be disabled using BIOS services.

Alwasy- Do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

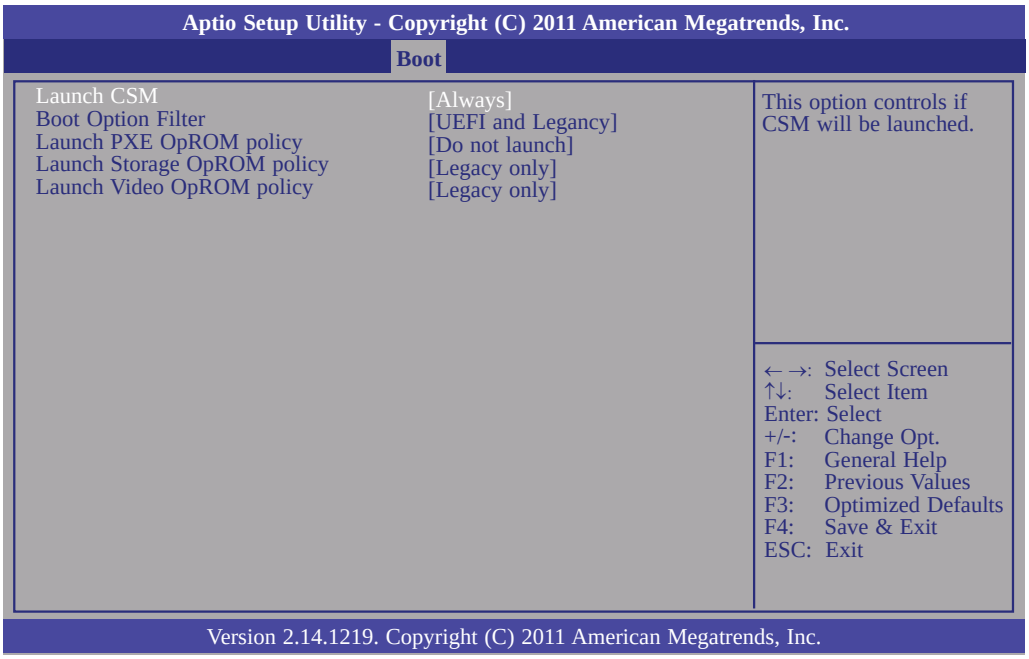
Option ROM Messages

Set display mode for option ROM.

Int19 Trap Response

BIOS reaction on Int19 trapping by option ROM.

CSM Parameters


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Boot
Launch CSM [Always]
Boot Option Filter [UEFI and Legacy]
Launch PXE OpROM policy [Do not launch]
Launch Storage OpROM policy [Legacy only]
Launch Video OpROM policy [Legacy only]
This option controls if CSM will be launched.
←→: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Boot Option Filter

This option controls what devices system(UEFI or legacy) can boot.

Launch PXE OpROM policy

Controls the execution of UEFI and legacy PXE OpROM.

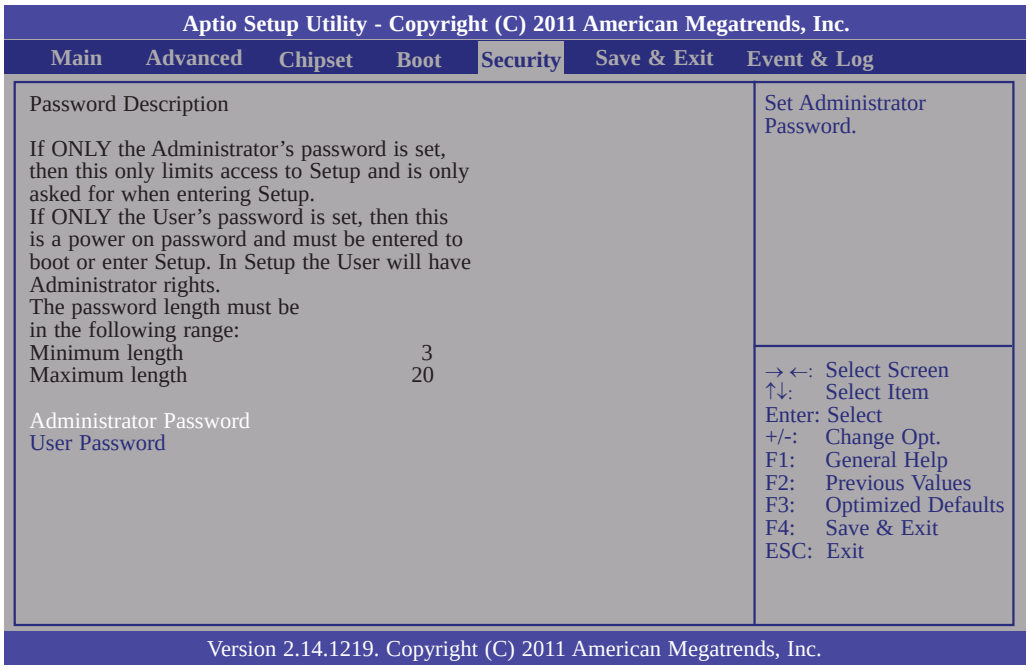
Launch Storage OpROM policy

Controls the execution of UEFI and legacy storage OpROM.

Launch Video OpROM policy

Controls the execution of UEFI and legacy video OpROM.

Security


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit Event & Log
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password length must be in the following range:
Minimum length 3
Maximum length 20
Administrator Password
User Password
Set Administrator Password.
→ ←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

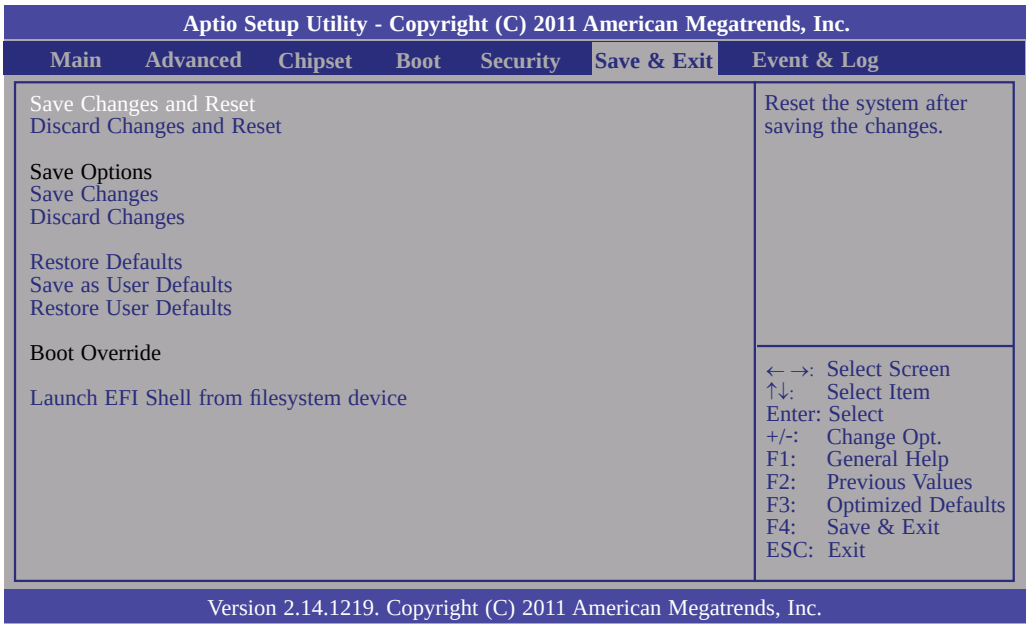
Administrator Password

Sets the administrator password.

User Password

Sets the user password.

Save & Exit



Save Changes and Reset

To save the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system after saving all changes made.

Discard Changes and Reset

To discard the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system setup without saving any changes.

Save Changes

Save changes done so far to any of the setup options.

Discard Changes

Discard changes done so far to any of the setup options.

Restore Defaults

To restore and load the optimized default values, select this field and then press <Enter>. A dialog box will appear. Select Yes to restore the default values of all the setup options.

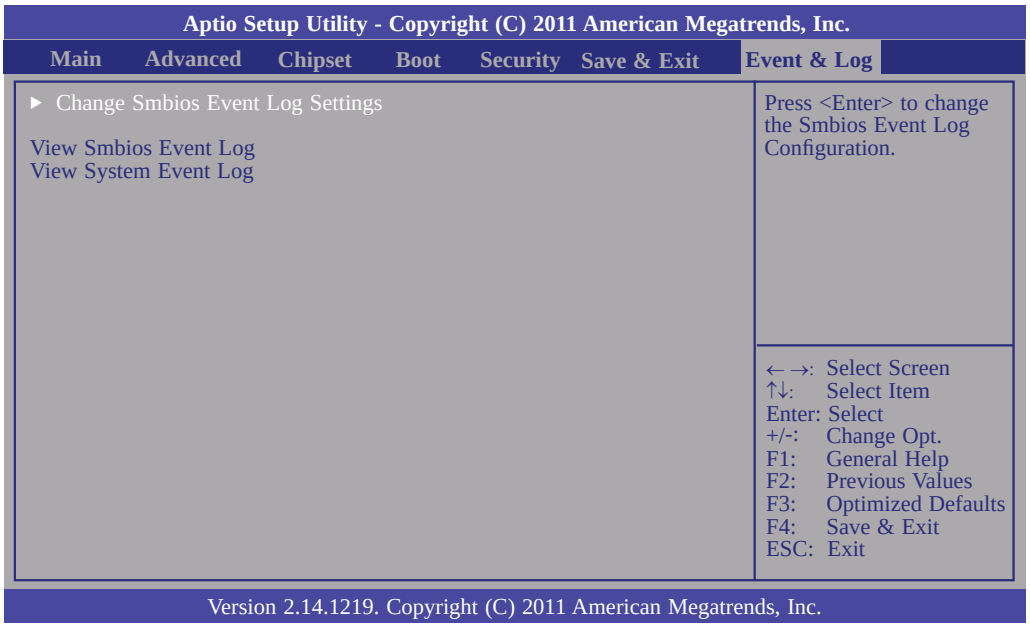
Save as User Defaults

To save changes done so far as user default, select this field and then press <Enter>. A dialog box will appear. Select Yes to save values as user default.

Restore User Defaults

To restore user default to all the setup options, select this field and then press <Enter>. A dialog box will appear. Select Yes to restore user default.

Event & Log



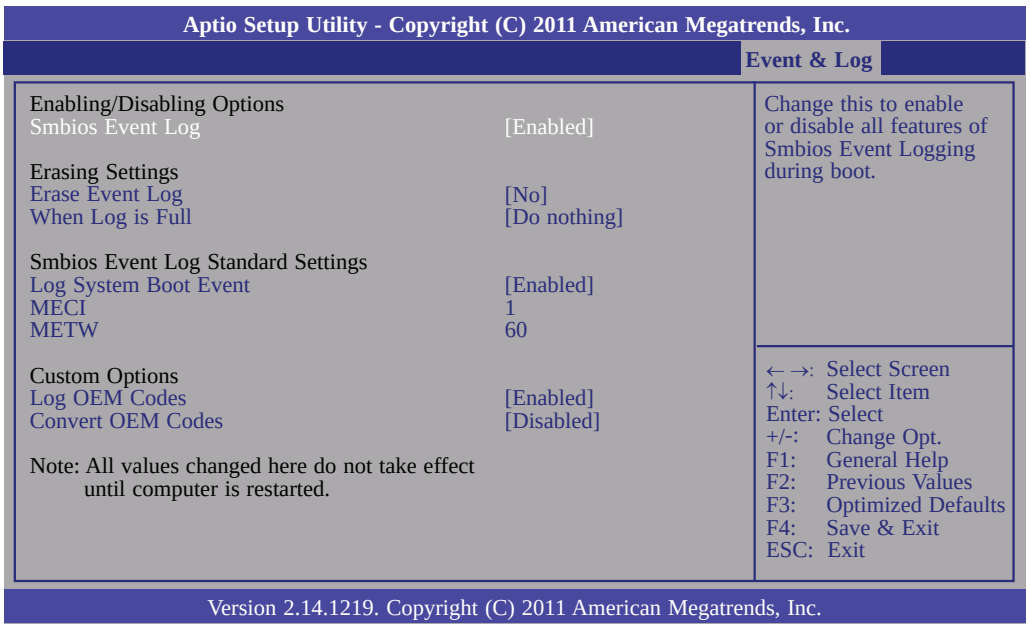
View Smbios Event Log

To see the Smbios Event Log parameter.

View System Event Log

To see the System Event Log parameter.

Change Smbios Event Log Settings


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Event & Log
Enabling/Disabling Options
Smbios Event Log [Enabled]
Erasing Settings
Erase Event Log [No]
When Log is Full [Do nothing]
Smbios Event Log Standard Settings
Log System Boot Event [Enabled]
MECI 1
METW 60
Custom Options
Log OEM Codes [Enabled]
Convert OEM Codes [Disabled]
Note: All values changed here do not take effect until computer is restarted.
Change this to enable or disable all features of Smbios Event Logging during boot.
←→: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Erase Event Log

Choose options for erasing Smbios Event Log. Erasing is done prior to any logging activation during reset.

When Log is Full

Choose options for reactions to a full Smbios Event Log.

Log System Boot Event

Choose options to enable/disable logging of system boot event.

MECI

Multipul Event Count Increment:

The number of occurences of a duplicate event that must pass before the multiple-event counter associated with the log entry is updated, specified as a numeric value in a range of 1 to 255.

METW

Multiple Event Time Window:

The number of minutes which must pass between duplicate log entries which ultilize a multipul-event counter. The value range from 0 to 99 minutes.

Log OEM Codes

Enable or disable the logging of EFI Status Codes as OEM Codes (if not already converted to legacy).

Convert OEM Codes

Enable or disable the converting of EFI Status Codes to Standard Smbios Types (Not all may be translated).

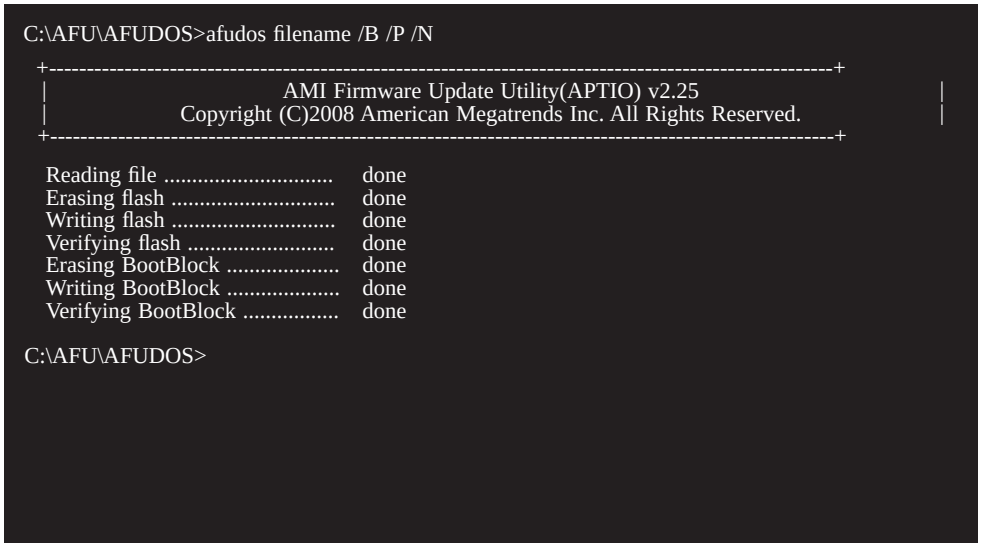
Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility, AFUDOS. EXE. Please contact technical support or your sales representative for the files.

To execute the utility, type:

A:> AFUDOS BIOS_File_Name /b /p /n

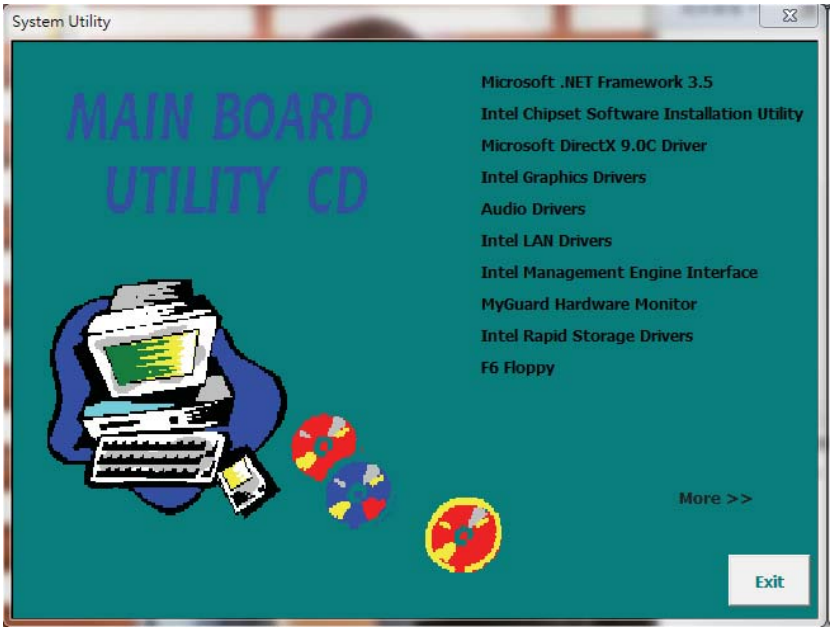
then press <Enter>.

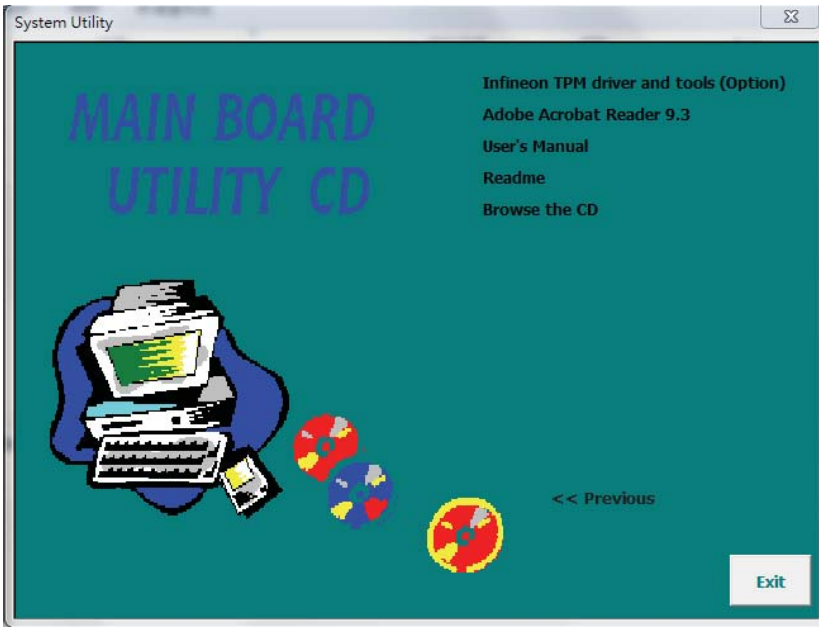

C:\AFU\AFUDOS>afudos filename /B /P /N
AMI Firmware Update Utility(APTIO) v2.25
Copyright (C)2008 American Megatrends Inc. All Rights Reserved.
Reading file ..... done
Erasing flash ..... done
Writing flash ..... done
Verifying flash ..... done
Erasing BootBlock ..... done
Writing BootBlock ..... done
Verifying BootBlock ..... done
C:\AFU\AFUDOS>

Chapter 4 - Supported Software

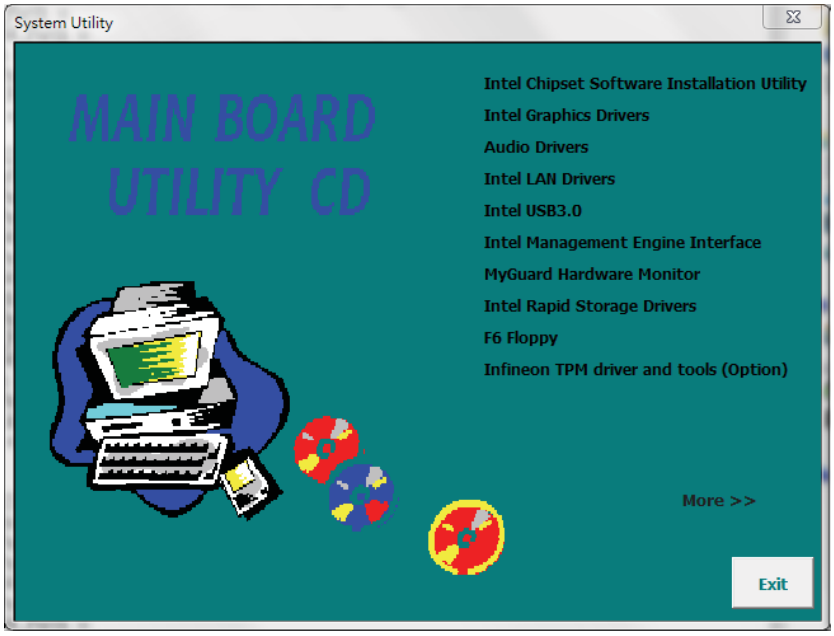
The CD that came with the system board contains drivers, utilities and software applications required to enhance the performance of the system board.

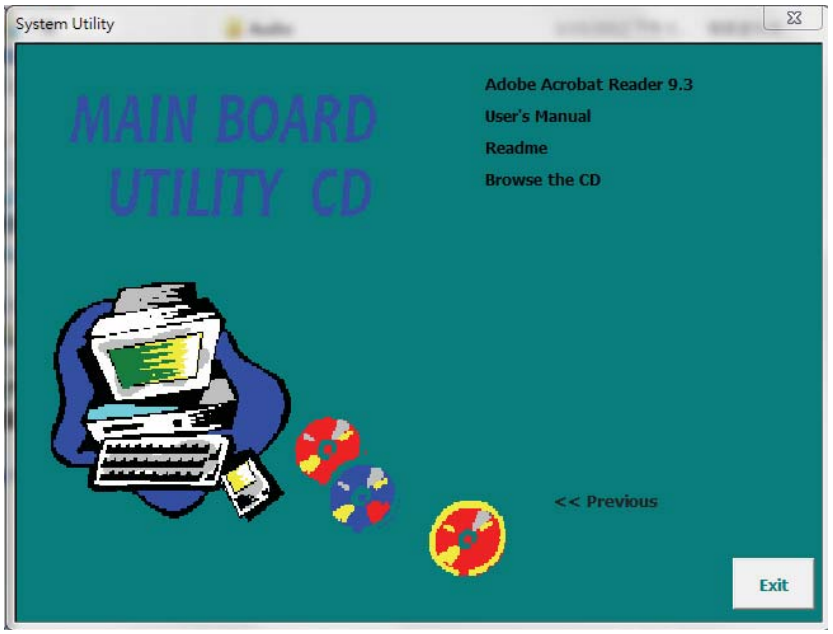
Insert the CD into a CD-ROM drive. The autorun screen (Mainboard Utility CD) will appear. If after inserting the CD, “Autorun” did not automatically start (which is, the Mainboard Utility CD screen did not appear), please go directly to the root directory of the CD and double-click “Setup”.





Auto Run Pages (for Windows 7)





Microsoft .NET Framework 3.5 (for Windows XP only)

Note:
Before installing Microsoft .NET Framework 3.5, make sure you have updated your Windows XP operating system to Service Pack 3.

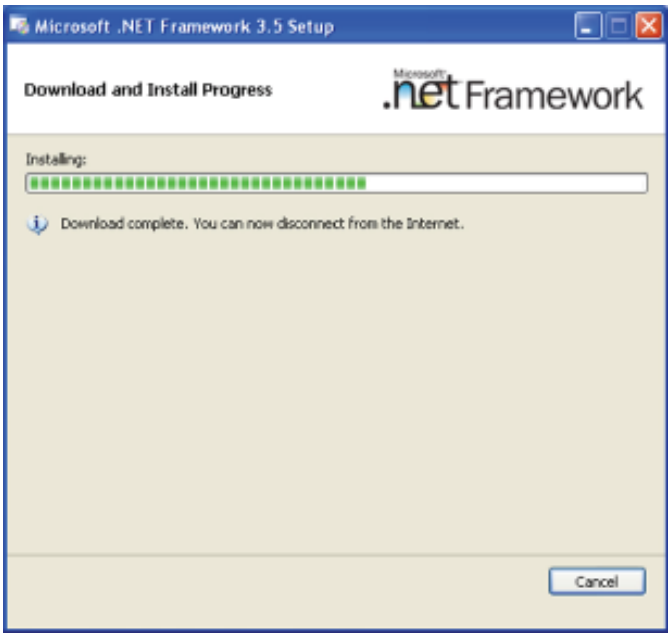
To install the driver, click “Microsoft .NET Framework 3.5” on the main menu.

1. Read the license agreement carefully.

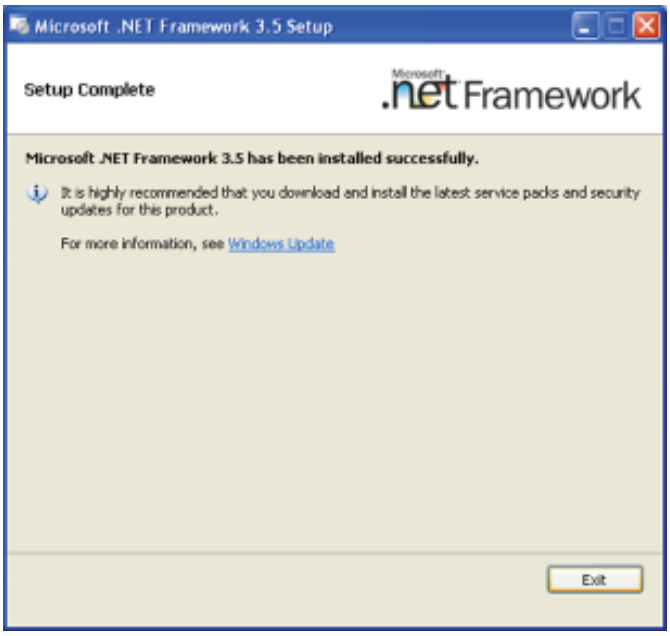
   Click “I have read and accept the terms of the License Agreement” then click Install.

Microsoft .NET Framework 3.5 Setup
Welcome to Setup
.net Framework
Be sure to carefully read and understand all the rights and restrictions described in the license terms. You must accept the license terms before you can install the software.
MICROSOFT SOFTWARE SUPPLEMENTAL LICENSE TERMS
Press the Page Down key to see more text.
Print
I have read and ACCEPT the terms of the License Agreement
I DO NOT ACCEPT the terms of the License Agreement
Send information about my setup experiences to Microsoft Corporation.
Details regarding the data collection policy
Download File Size: 60 MB
Download Time Estimate: 2 hr 27 min (56 kbps)
16 min (512 kbps)
Install >
Cancel

2. Setup is now installing the driver.



3. Click Exit.


Microsoft .NET Framework 3.5 Setup
Setup Complete
Microsoft .NET Framework
Microsoft .NET Framework 3.5 has been installed successfully.
It is highly recommended that you download and install the latest service packs and security updates for this product.
For more information, see Windows Update
Exit

Intel Chipset Software Installation Utility

The Intel Chipset Software Installation Utility is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utility, click “Intel Chipset Software Installation Utility” on the main menu.

1. Setup is ready to install the utility. Click Next.

Intel® Chipset Device Software
Intel® Chipset Device Software
intel
Welcome to the Setup Program
This setup program will install the Intel® Chipset Device Software onto this computer. It is strongly recommended that you exit all programs before continuing.
< Back
Next >
Cancel
Intel® Installation Framework

2. Read the license agreement then click Yes.

Intel® Chipset Device Software
Intel® Chipset Device Software
License Agreement
intel
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
< Back
Yes
No
Intel® Installation Framework

3. Go through the readme document for more installation tips then click Next.

Intel® Chipset Device Software
Intel® Chipset Device Software
Readme File Information
Refer to the Readme file below to view the system requirements and installation information.
Press the Page Down key to view the rest of the file.
****
* Product: Intel(R) Chipset Device Software
* Release: Production Version
* Version: 9.0.0.1008
* Target Chipset#: Intel(R) 4 Series Chipset
* Date: May 01 2008
****
< Back
Next >
Cancel
Intel® Installation Framework

4. Click Finish to exit setup.

Intel® Chipset Device Software
Intel® Chipset Device Software
Setup Is Complete
The setup program successfully installed the Intel® Chipset Device Software onto this computer.
Click Finish to complete the setup process.
Finish
Intel® Installation Framework

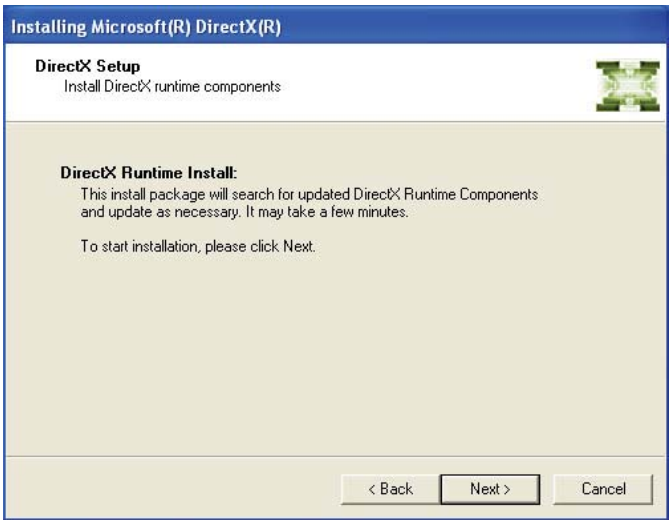
Microsoft DirectX 9.0C (for Windows XP only)

To install the driver, click “Microsoft DirectX 9.0C” on the main menu.

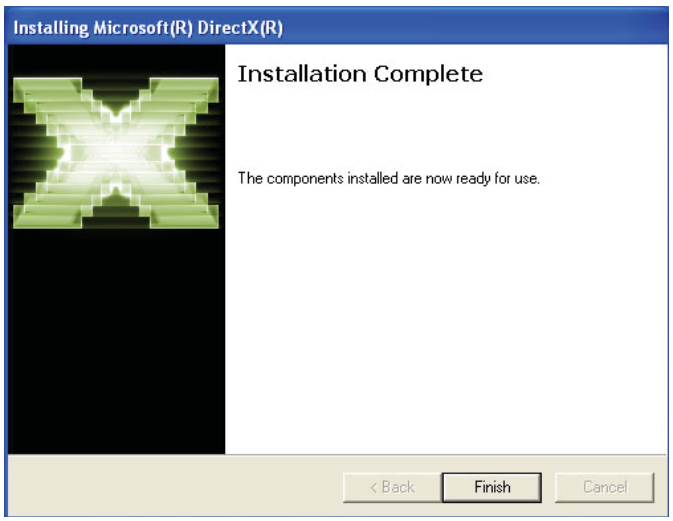
1. Click “I accept the agreement” then click Next.

Installing Microsoft(R) DirectX(R)
Welcome to setup for DirectX
The DirectX setup wizard guides you through installation of DirectX Runtime Components. Please read the following license agreement. Press the PAGE DOWN key to see the rest of the agreement. You must accept the agreement to continue the setup.
MICROSOFT DirectX 9.0c
SUPPLEMENTAL END USER LICENSE AGREEMENT FOR MICROSOFT SOFTWARE ("Supplemental EULA")
IMPORTANT: READ CAREFULLY - These Microsoft Corporation ("Microsoft") operating system components, including any "online" or electronic documentation ("OS Components") are subject to the terms and conditions of
I accept the agreement
I don't accept the agreement
< Back
Next >
Cancel

2. To start installation, click Next.


Installing Microsoft(R) DirectX(R)
DirectX Setup
Install DirectX runtime components
DirectX Runtime Install:
This install package will search for updated DirectX Runtime Components and update as necessary. It may take a few minutes.
To start installation, please click Next.
< Back
Next >
Cancel

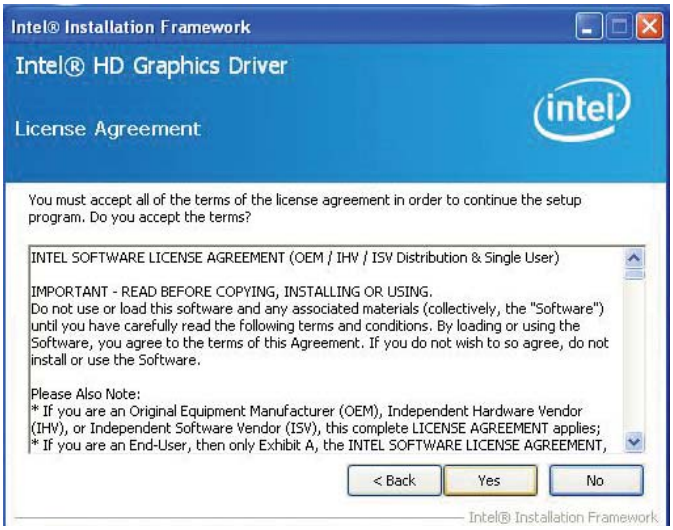
3. Click Finish. Reboot the system for DirectX to take effect.



Intel Graphics Drivers (for Windows 7)

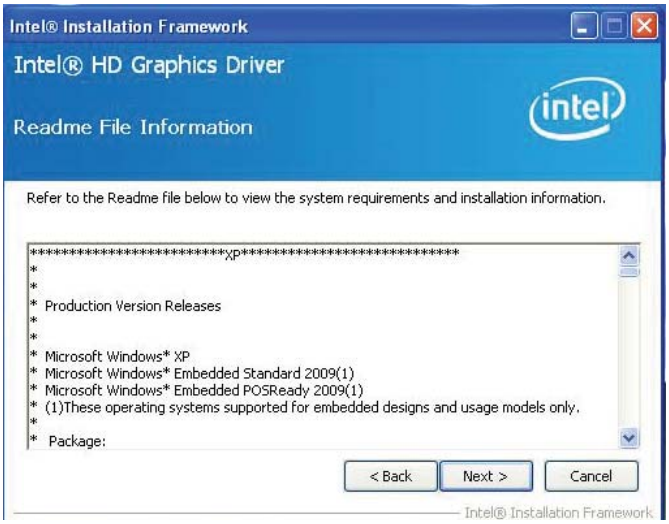
To install the driver, click “Intel Graphics Drivers” on the main menu.

1. Setup is now ready to install the graphics driver. Click Next.

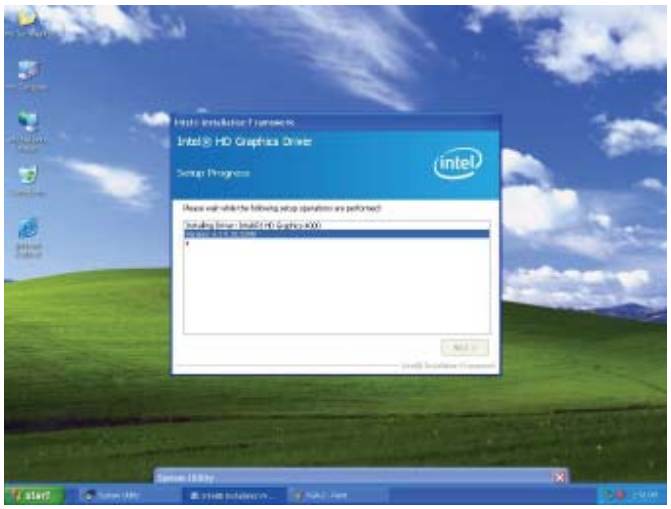

Intel® Installation Framework
Intel® HD Graphics Driver
License Agreement
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
* If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT,
< Back
Yes
No
Intel® Installation Framework

By default, the “Automatically run WinSAT and enable the Windows Aero desktop theme” is enabled. With this enabled, after installing the graphics driver and the system rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows Vista desktop appears. The “blank screen” period is the time Windows is testing the graphics performance.

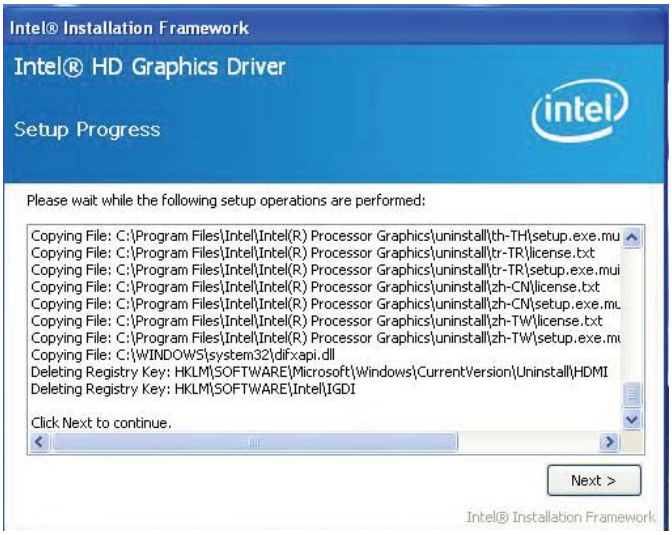
2. Read the license agreement then click Yes.



3. Go through the readme document for system requirements and installation tips then click Next.



4. Setup is now installing the driver. Click Next to continue.


Intel® Installation Framework
Intel® HD Graphics Driver
Setup Progress
Please wait while the following setup operations are performed:
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\th-TH\setup.exe.mu
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\tr-TR\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\tr-TR\setup.exe.mui
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\zh-CN\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\zh-CN\setup.exe.mu
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\zh-TW\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\zh-TW\setup.exe.mu
Copying File: C:\WINDOWS\system32\difxapi.dll
Deleting Registry Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\HDMI
Deleting Registry Key: HKLM\SOFTWARE\Intel\IGDI
Click Next to continue.
Next >
Intel® Installation Framework

5. Click “Yes, I want to restart this computer now” then click Finish.

   Restarting the system will allow the new software installation to take effect.

Intel® Installation Framework
Intel® HD Graphics Driver
Setup Is Complete
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

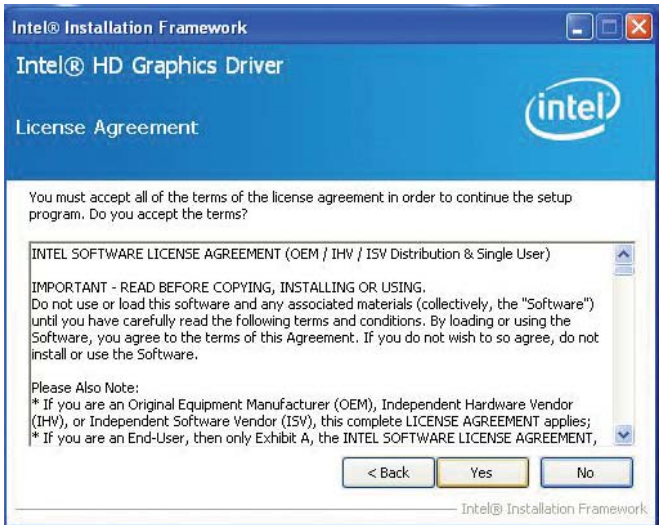
Intel Graphics Drivers (for Windows XP)

To install the driver, click “Intel Graphics Drivers” on the main menu.

1. Setup is ready to install the graphics driver. Click Next.

Intel® Installation Framework
Intel® HD Graphics Driver
Welcome to the Setup Program
intel
This setup program will install the following components:
- Intel® HD Graphics Driver
- Intel® Display Audio Driver
It is strongly recommended that you exit all programs before continuing. Click Next to continue.
< Back
Next >
Cancel
Intel® Installation Framework

2. Read the license agreement then click Yes.


Intel® Installation Framework
Intel® HD Graphics Driver
License Agreement
intel
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
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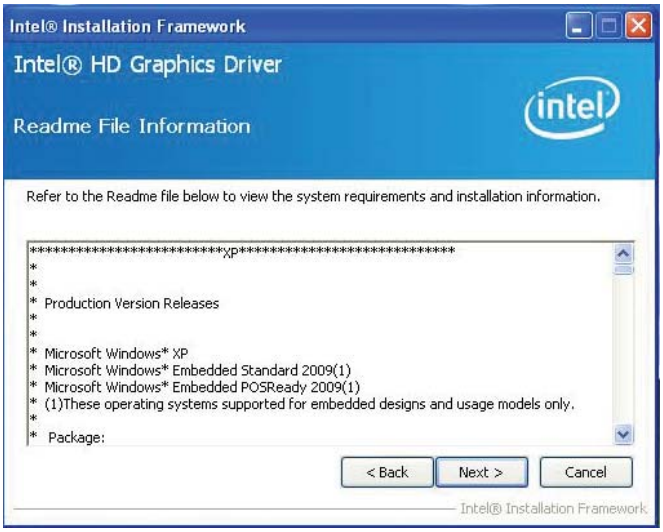
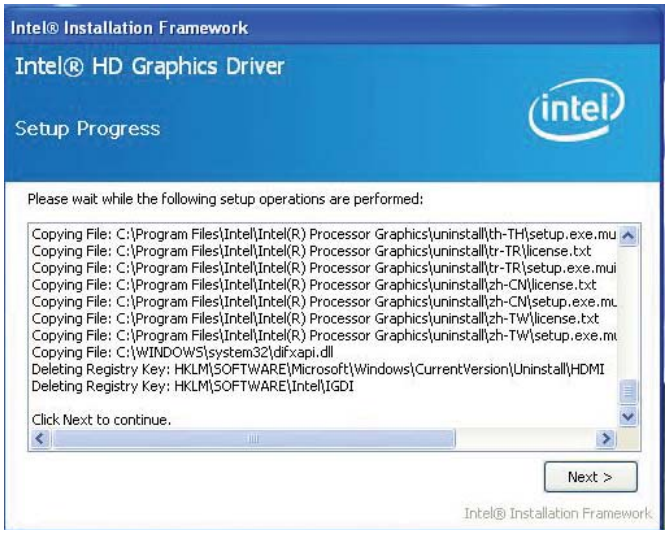
< Back
Yes
No
Intel® Installation Framework

3. Go through the readme document for more installation tips then click Next.

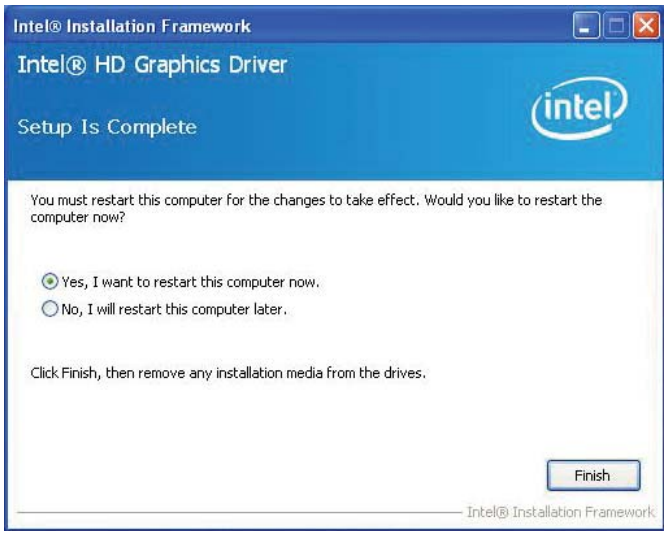


4. Setup is currently installing the driver. After installation has completed, click Next.


Intel® Installation Framework
Intel® HD Graphics Driver
Setup Progress
Please wait while the following setup operations are performed:
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\th-TH\setup.exe.mu
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\tr-TR\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\tr-TR\setup.exe.mui
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\zh-CN\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\zh-CN\setup.exe.mu
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\zh-TW\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\zh-TW\setup.exe.mu
Copying File: C:\WINDOWS\system32\difxapi.dll
Deleting Registry Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\HDMI
Deleting Registry Key: HKLM\SOFTWARE\Intel\IGDI
Click Next to continue.
Next >
Intel® Installation Framework

5. Click “Yes, I want to restart this computer now.” then click Finish.

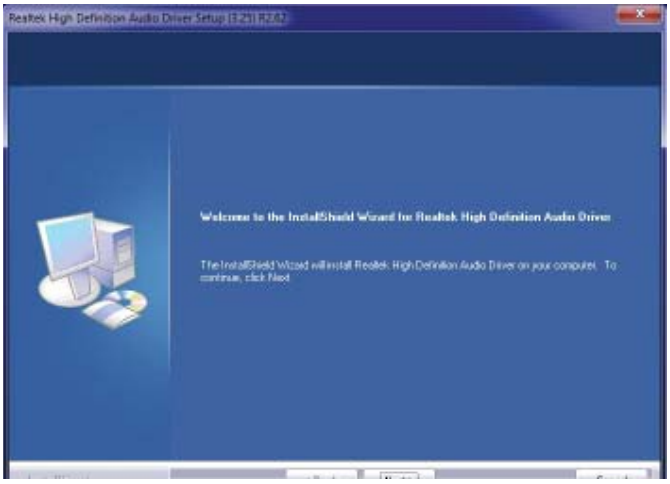
   Restarting the system will allow the new software installlation to take effect.


Intel® Installation Framework
Intel® HD Graphics Driver
Setup Is Complete
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

Audio Drivers

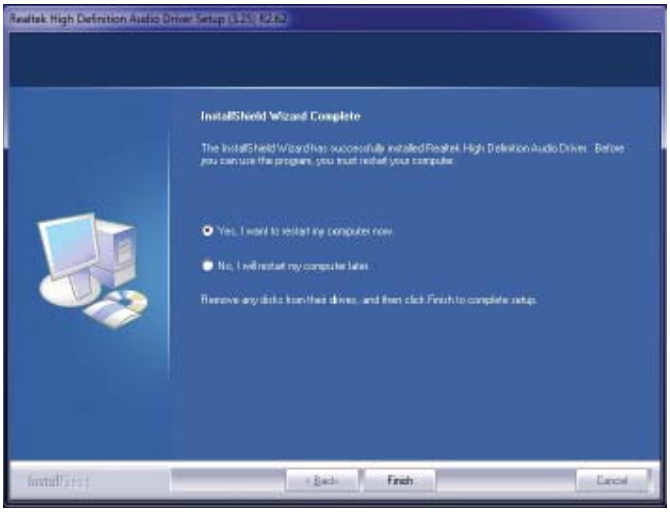
To install the driver, click “Audio Drivers” on the main menu.

1. Setup is ready to install the driver. Click Next.


Realtek High Definition Audio Driver Setup
Welcome to the InstallShield Wizard for Realtek High Definition Audio Driver

2. Click “Yes, I want to restart my computer now” then click Finish.

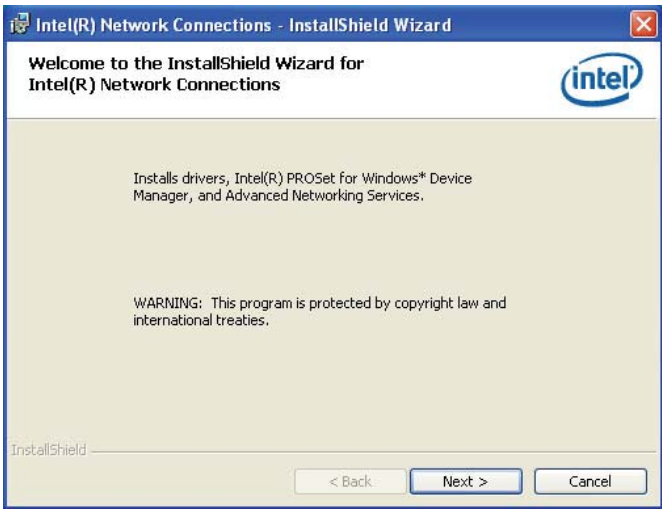
   Restarting the system will allow the new software installation to take effect.


Realtek High Definition Audio Driver Setup
InstallShield Wizard Complete
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

Intel LAN Drivers

To install the driver, click “Intel LAN Drivers” on the main menu.

1. Setup is ready to install the driver. Click Next.


Intel(R) Network Connections - InstallShield Wizard
Welcome to the InstallShield Wizard for Intel(R) Network Connections
Installs drivers, Intel(R) PROSet for Windows* Device Manager, and Advanced Networking Services.
WARNING: This program is protected by copyright law and international treaties.
InstallShield
< Back
Next >
Cancel

2. Click “I accept the terms in the license agreement” then click “Next”.

Intel(R) Network Connections - InstallShield Wizard
License Agreement
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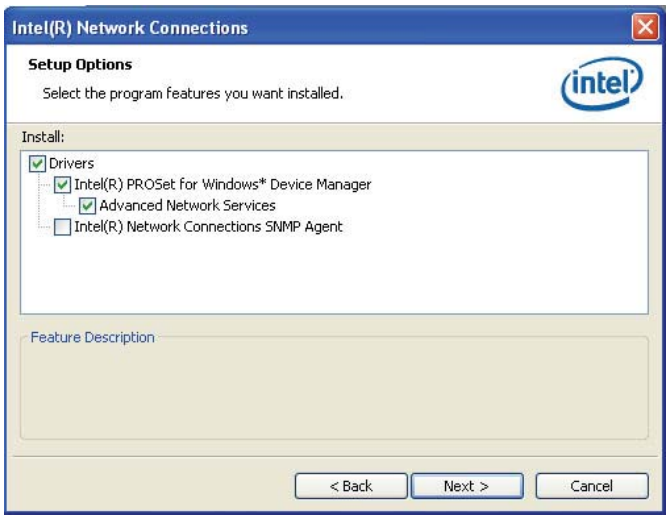
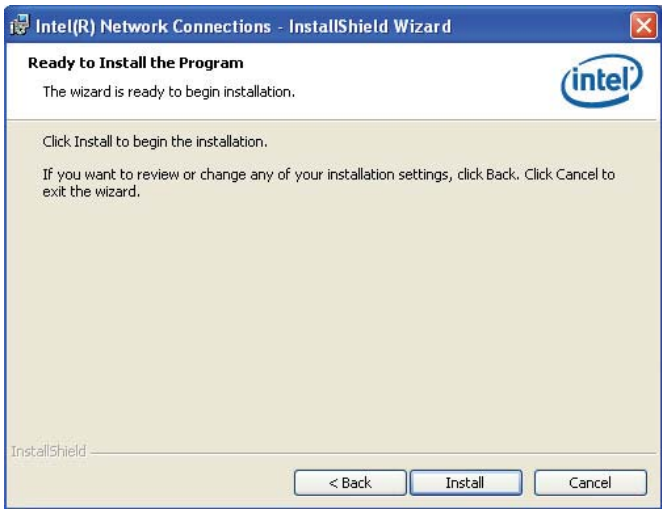
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
InstallShield
< Back
Next >
Cancel

3. Select the program featuers you want installed then click Next.



4. Click Install to begin the installation.


Intel(R) Network Connections - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

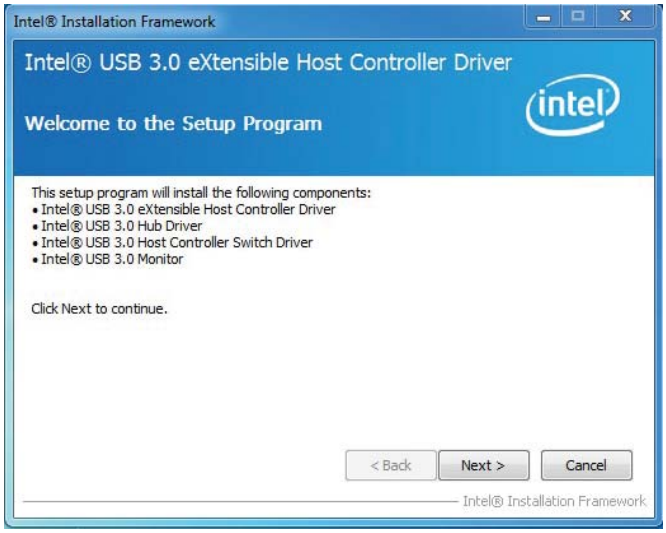
5. After completing installation, click Finish.

Intel(R) Network Connections - InstallShield Wizard
InstallShield Wizard Completed
To access new features, open Device Manager, and view the properties of the network adapters.
InstallShield
< Back
Finish
Cancel

Intel USB 3.0 (for Windows 7 only)

To install the driver, click “Intel USB 3.0” on the main menu.

1. Setup is ready to install the graphics driver. Click Next.


Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
Welcome to the Setup Program
intel
This setup program will install the following components:
• Intel® USB 3.0 eXtensible Host Controller Driver
• Intel® USB 3.0 Hub Driver
• Intel® USB 3.0 Host Controller Switch Driver
• Intel® USB 3.0 Monitor
Click Next to continue.
< Back
Next >
Cancel
Intel® Installation Framework

2. Read the license agreement then click Yes.

Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
License Agreement
intel
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
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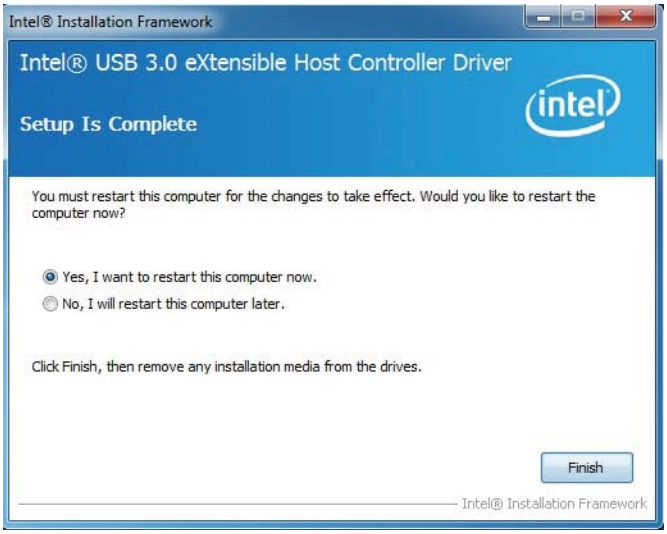
< Back
Yes
No
Intel® Installation Framework

3. Go through the readme document for more installation tips then click Next.

Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
Readme File Information
intel
Refer to the Readme file below to view the system requirements and installation information.
***** WARNING *****
Do not run this driver's installer (Setup.exe) from a USB storage device (ie. external USB hard drive or USB thumb drive). For proper installation, please copy driver files to a local hard drive folder and run from there.
****
*
* Production Version Releases
*
* Microsoft Windows* 7
*
< Back
Next >
Cancel
Intel® Installation Framework

4. Setup is currently installing the driver. After installation has completed, click Next.

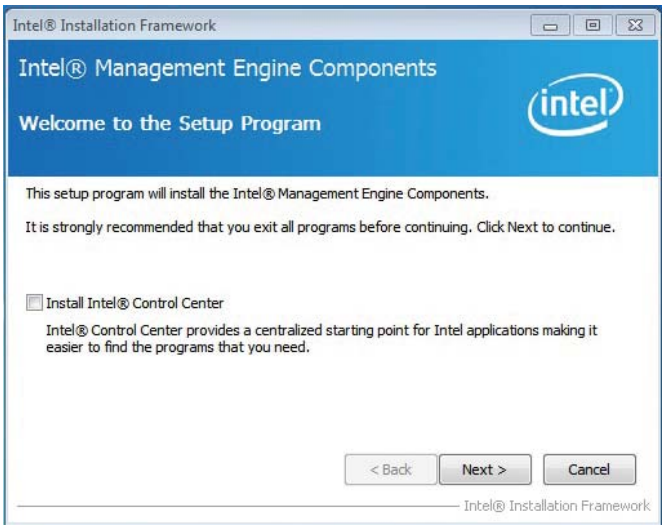
5. After completing installation, click Finish.



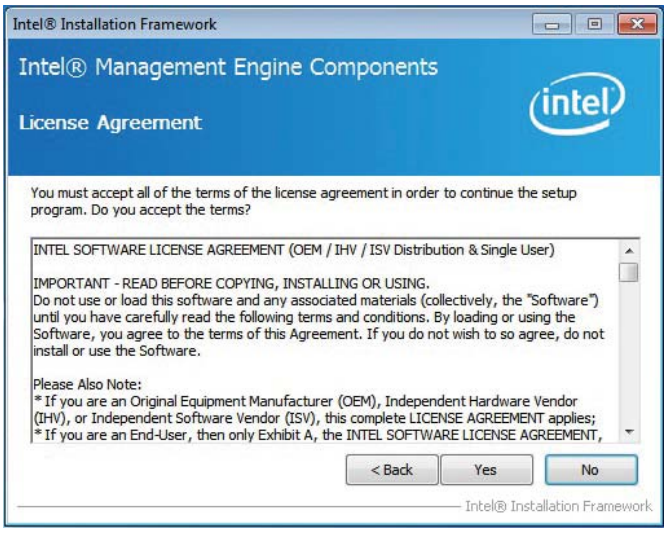
Intel Management Engine Drivers

To install the driver, click “Intel Management Engine Driver” on the main menu.

1. Setup is ready to install the driver. Click Next.


Intel® Installation Framework
Intel® Management Engine Components
Welcome to the Setup Program
intel
This setup program will install the Intel® Management Engine Components.
It is strongly recommended that you exit all programs before continuing. Click Next to continue.
Install Intel® Control Center
Intel® Control Center provides a centralized starting point for Intel applications making it easier to find the programs that you need.
< Back
Next >
Cancel
Intel® Installation Framework

2. Read the license agreement then click Yes.


Intel® Installation Framework
Intel® Management Engine Components
License Agreement
intel
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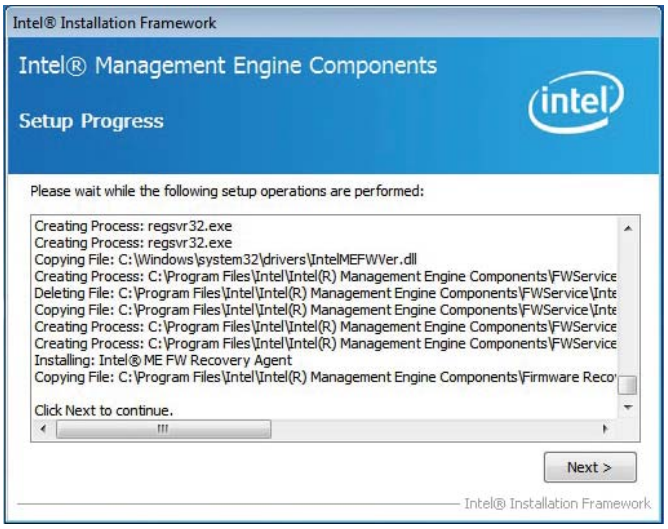
< Back
Yes
No
Intel® Installation Framework

3. Setup is currently installing the driver. After installation has completed, click Next.


Intel® Installation Framework
Intel® Management Engine Components
Setup Progress
Please wait while the following setup operations are performed:
Creating Process: regsvr32.exe
Creating Process: regsvr32.exe
Copying File: C:\Windows\system32\drivers\IntelMEFWVer.dll
Creating Process: C:\Program Files\Intel\Intel(R) Management Engine Components\FWService
Deleting File: C:\Program Files\Intel\Intel(R) Management Engine Components\FWService\Inte
Copying File: C:\Program Files\Intel\Intel(R) Management Engine Components\FWService\Inte
Creating Process: C:\Program Files\Intel\Intel(R) Management Engine Components\FWService
Creating Process: C:\Program Files\Intel\Intel(R) Management Engine Components\FWService
Installing: Intel® ME FW Recovery Agent
Copying File: C:\Program Files\Intel\Intel(R) Management Engine Components\Firmware Reco
Click Next to continue.
Next >
Intel® Installation Framework

4. After completing installation, click Finish.

Intel® Installation Framework
Intel® Management Engine Components
Setup Is Complete
The setup program successfully installed the following components:
- Intel® Management Engine Interface
- Intel® Dynamic Application Loader
- Intel® Identity Protection Technology (Intel® IPT)
- Serial Over LAN
- Intel® Management and Security Status
- Local Management Service
- User Notification Service
Click Finish to complete the setup process.
Finish
Intel® Installation Framework

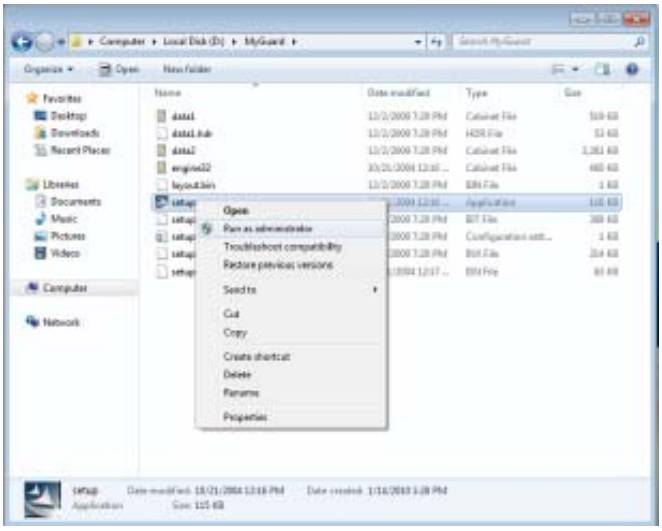
MyGuard Hardware Monitor

1. Locate for the MyGuard folder in the provided disc.

2. In the MyGuard folder, right-click on the “setup” file.

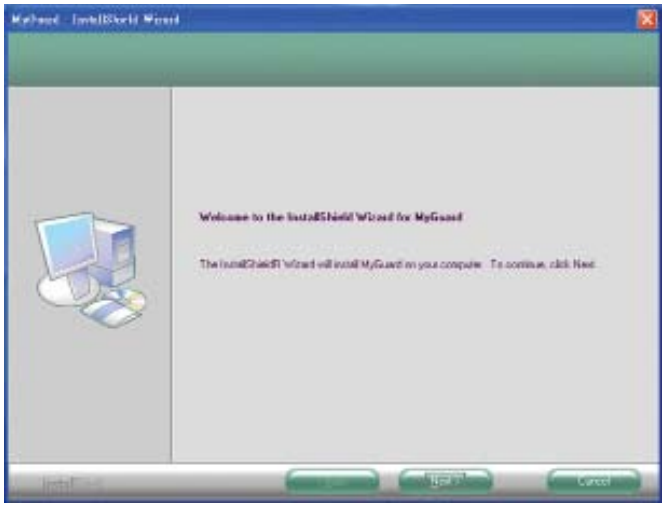
3. Select Run As Administrator.

4. Double-click Setup.

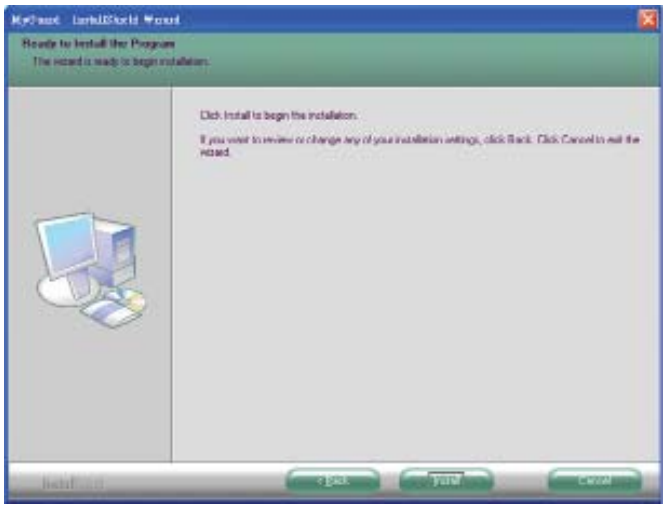


Important:
Perform steps 1-3 only when using Windows 7 or Windows Vista.

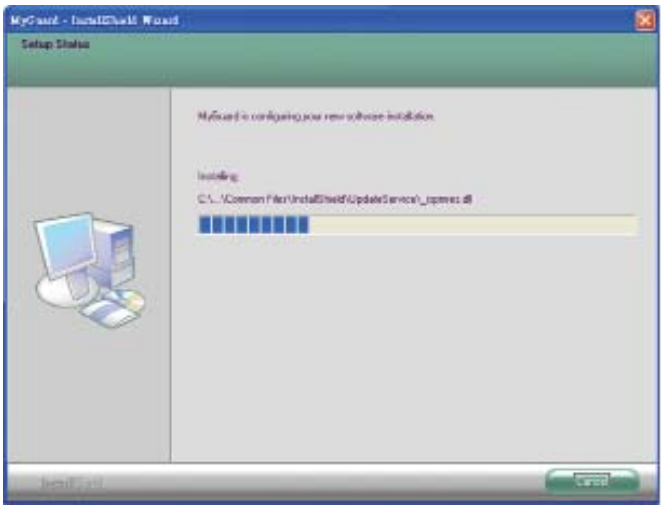
5. Setup is ready to install the utility. Click Next.



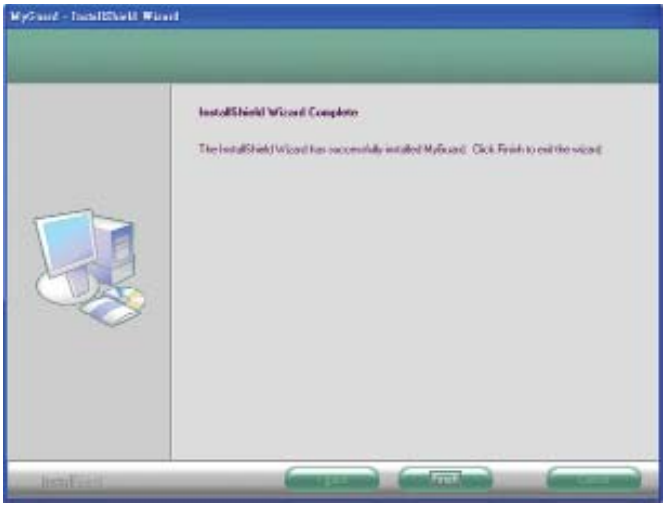
6. Click Install to begin installation.



7. Setup is currently installing the utility.



8. After completing installation, click Finish to exit setup.

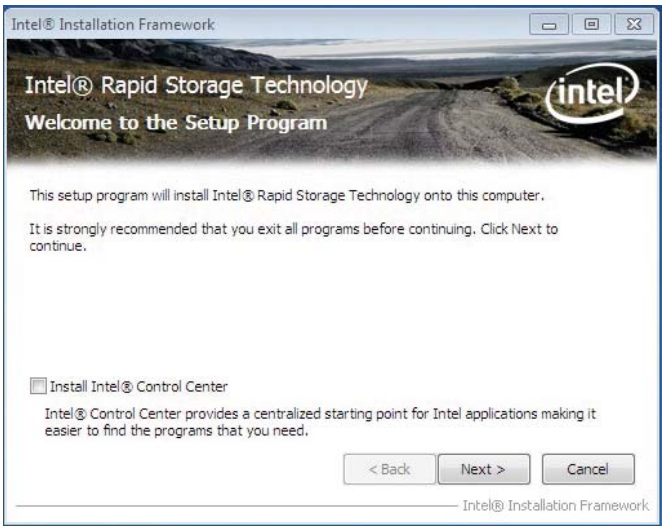


Intel Rapid Storage Drivers

To install the driver, click “Intel Rapid Storage Drivers” on the main menu.

Note:
Windows Vista is not supported.

1. Setup is ready to install the driver. Click Next.


Intel® Installation Framework
Intel® Rapid Storage Technology
Welcome to the Setup Program
intel
This setup program will install Intel® Rapid Storage Technology onto this computer.
It is strongly recommended that you exit all programs before continuing. Click Next to continue.
Install Intel® Control Center
Intel® Control Center provides a centralized starting point for Intel applications making it easier to find the programs that you need.
< Back
Next >
Cancel
Intel® Installation Framework

2. Read the license agreement then click Yes.

Intel® Installation Framework
Intel® Rapid Storage Technology
License Agreement
intel
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
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< Back
Yes
No
Intel® Installation Framework

3. Go through the readme document for more installation tips then click Next.

Intel® Installation Framework
Intel® Rapid Storage Technology
Readme File Information
Refer to the Readme file below to view the system requirements and installation information.
* Installation Readme for
* Intel(R) Rapid Storage Technology (Intel(R) RST).
* Refer to the system requirements for the operating
* systems supported by Intel Rapid Storage Technology.
* This document makes references to products developed by
* Intel. There are some restrictions on how these products
* may be used, and what information may be disclosed to
* others. Please read the Disclaimer section at the bottom
< Back
Next >
Cancel
Intel® Installation Framework

4. Setup is currently installing the driver. After installation has completed, click Next.

5. Click “Yes, I want to restart this computer now.” then click Finish.

   Restarting the system will allow the new software installlation to take effect.

Intel® Installation Framework
Intel® Rapid Storage Technology
Setup Is Complete
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

F6 Floppy

This is used to create a floppy driver diskette needed when you install Windows® XP using the F6 installation method. This will allow you to install the operating system onto a hard drive when in AHCI mode.

1. Insert a blank floppy diskette.

2. Locate for the drivers in the CD then copy them to the floppy diskette. The CD includes drivers for both 32-bit and 64-bit operating systems. The path to the drivers are shown below.

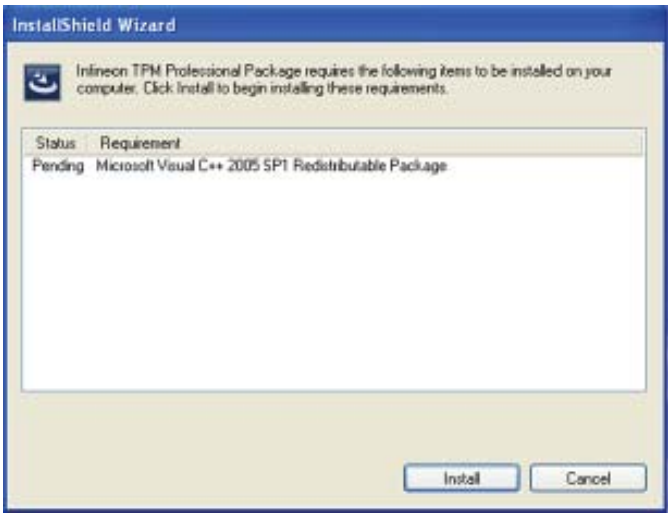
   32-bit
   CD Drive:\AHCI_RAID\F6FLOPPY\f6flpy32

   64-bit
   CD Drive:\AHCI_RAID\F6FLOPPY\f6flpy64

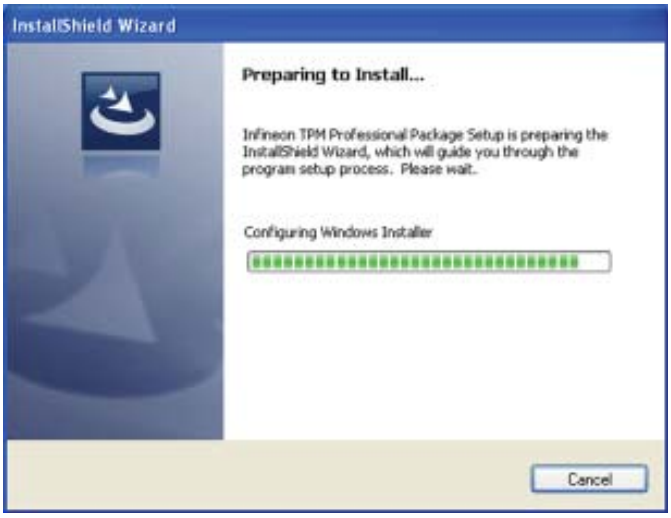
Infineon TPM Driver and Tool (optional)

To install the driver, click “Infineon TPM driver and tool (option)” on the main menu.

1. TPM requires installing the Microsoft Visual C++ package prior to installing the driver. Click Install.


InstallShield Wizard
Infineon TPM Professional Package requires the following items to be installed on your computer. Click Install to begin installing these requirements.
Status
Requirement
Pending
Microsoft Visual C++ 2005 SP1 Redistributable Package
Install
Cancel

2. The setup program is preparing to install the driver.


InstallShield Wizard
Preparing to Install...
Infineon TPM Professional Package Setup is preparing the InstallShield Wizard, which will guide you through the program setup process. Please wait.
Configuring Windows Installer
Cancel

3. The setup program is ready to install the driver. Click Next.

Infineon TPM Professional Package - InstallShield Wizard
Welcome to the InstallShield Wizard for Infineon TPM Professional Package
Version 3.6
The InstallShield(R) Wizard will install Infineon TPM Professional Package on your computer. To continue, click Next.
WARNING: This program is protected by copyright law and international treaties.
< Back
Next >
Cancel

4. Click “I accept the terms in the license agreement” and then click “Next”.

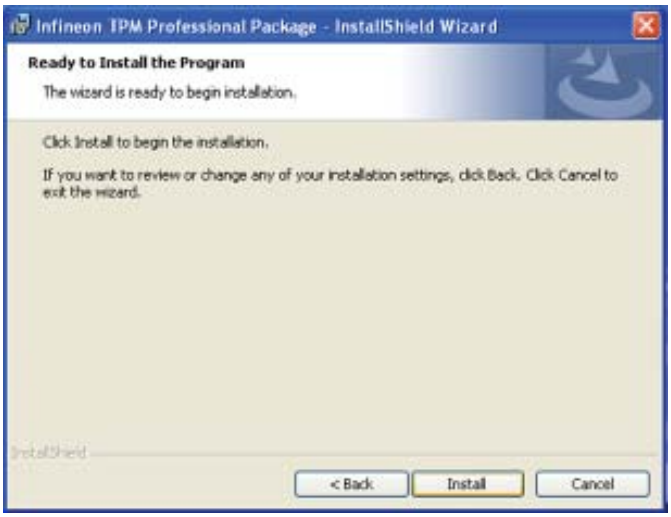
Infineon TPM Professional Package - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
Software Setup End User License Conditions for the Infineon TPM Professional Package
1. Attention
This software contains copyright protected content (e.g. codes and structures) and confidential content (e.g. algorithms, ideas and concepts) of Infineon Technologies AG and Microsoft Corporation (Microsoft patterns & practices Enterprise Library © Microsoft Corporation).
I accept the terms in the license agreement
I do not accept the terms in the license agreement
InstallShield
< Back
Next >
Cancel

5. Enter the necessary information and then click Next.

6. Select a setup type and then click Next.

Infineon TPM Professional Package - InstallShield Wizard
Setup Type
Choose the setup type that best suits your needs.
Please select a setup type.
Complete
All program features will be installed. (Requires the most disk space.)
Custom
Choose which program features you want installed and where they will be installed. Recommended for advanced users.
InstallShield
< Back
Next >
Cancel

7. Click Install.


Infineon TPM Professional Package - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

8. The setup program is currently installing the driver.

Infineon TPM Professional Package - InstallShield Wizard
Installing Infineon TPM Professional Package
The program features you selected are being installed.
Please wait while the InstallShield Wizard installs Infineon TPM Professional Package. This may take several minutes.
Status:
InstallShield
< Back
Next >
Cancel

9. Click Finish.

Infineon TPM Professional Package - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed Infineon TPM Professional Package. Click Finish to exit the wizard.
Show the readme file
< Back
Finish
Cancel

10. Click Yes to restart the system.

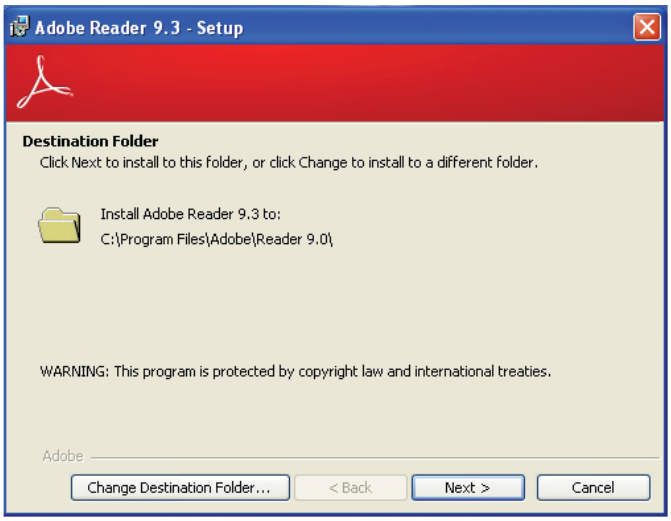
    Restarting the system will allow the new software installation to take effect.

Infineon TPM Professional Package Installer Info...
You must restart your system for the configuration changes made to Infineon TPM Professional Package to take effect. Click Yes to restart now or No if you plan to restart later.
Yes
No

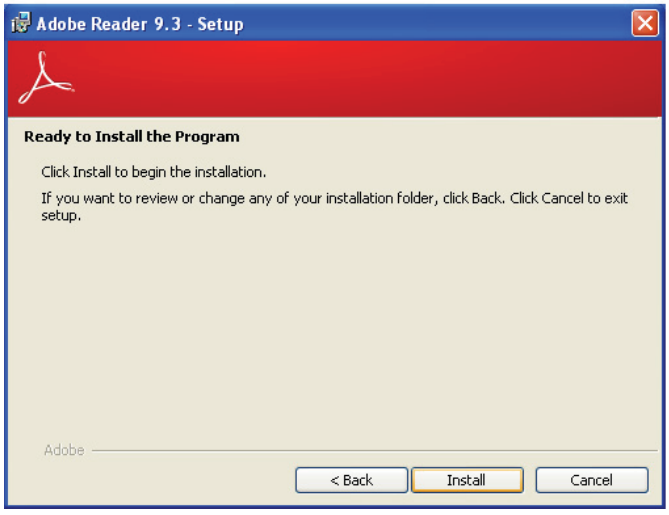
Adobe Acrobat Reader 9.3

To install the reader, click “Adobe Acrobat Reader 9.3” on the main menu.

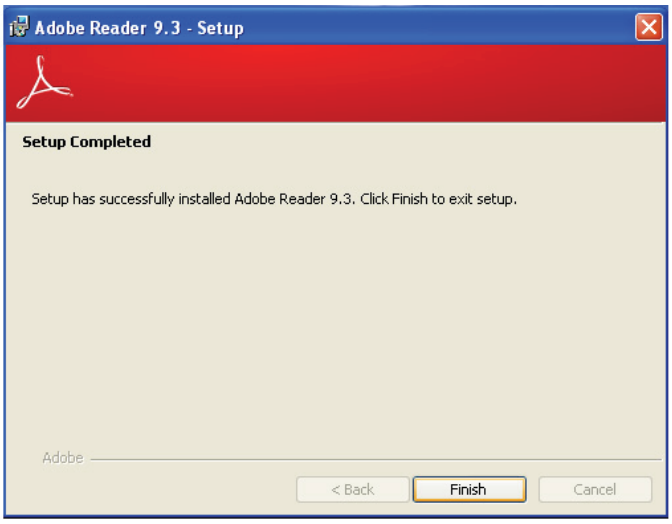
1. Click Next to install or click Change Destination Folder to select another folder.


Adobe Reader 9.3 - Setup
Destination Folder
Click Next to install to this folder, or click Change to install to a different folder.
Install Adobe Reader 9.3 to:
C:\Program Files\Adobe\Reader 9.0\
WARNING: This program is protected by copyright law and international treaties.
Adobe
Change Destination Folder...
< Back
Next >
Cancel

2. Click Install to begin installation.


Adobe Reader 9.3 - Setup
Ready to Install the Program
Click Install to begin the installation.
If you want to review or change any of your installation folder, click Back. Click Cancel to exit setup.
Adobe
< Back
Install
Cancel

3. Click Finish to exit installation.



Chapter 5 - RAID

The system board allows configuring RAID on Serial ATA drives. It supports RAID 0, RAID 1, RAID 5 and RAID 10.

RAID Levels

RAID 0 (Striped Disk Array without Fault Tolerance)

RAID 0 uses two new identical hard disk drives to read and write data in parallel, interleaved stacks. Data is divided into stripes and each stripe is written alternately between two disk drives. This improves the I/O performance of the drives at different channel; however it is not fault tolerant. A failed disk will result in data loss in the disk array.

RAID 1 (Mirroring Disk Array with Fault Tolerance)

RAID 1 copies and maintains an identical image of the data from one drive to the other drive. If a drive fails to function, the disk array management software directs all applications to the other drive since it contains a complete copy of the drive's data. This enhances data protection and increases fault tolerance to the entire system. Use two new drives or an existing drive and a new drive but the size of the new drive must be the same or larger than the existing drive.

RAID 5

RAID 5 stripes data and parity information across hard drives. It is fault tolerant and provides better hard drive performance and more storage capacity.

RAID 10 (Mirroring and Striping)

RAID 10 is a combination of data striping and data mirroring providing the benefits of both RAID 0 and RAID 1. Use four new drives or an existing drive and three new drives for this configuration.

Settings

To enable the RAID function, the following settings are required.

1. Connect the Serial ATA drives.
2. Configure Serial ATA in the AMI BIOS.
3. Configure RAID in the RAID BIOS.
4. Install the RAID driver during OS installation.
5. Install the Intel Rapid Storage Drivers.

Step 1: Connect the Serial ATA Drives

Refer to chapter 2 for details on connecting the Serial ATA drives.

Important:

1. Make sure you have installed the Serial ATA drives and connected the data cables otherwise you won't be able to enter the RAID BIOS utility.
2. Treat the cables with extreme caution especially while creating RAID. A damaged cable will ruin the entire installation process and operating system. The system will not boot and you will lost all data in the hard drives. Please give special attention to this warning because there is no way of recovering back the data.

Step 2: Configure Serial ATA in the AMI BIOS

1. Power-on the system then press <Del> to enter the main menu of the AMI BIOS.
2. Configure Serial ATA in the appropriate fields.
3. Save the changes in the Save & Exit menu.
4. Reboot the system.

Step 3: Configure RAID in the RAID BIOS

When the system powers-up and all drives have been detected, the Intel RAID BIOS status message screen will appear. Press the <Ctrl> and <I> keys simultaneously to enter the utility. The utility allows you to build a RAID system on Serial ATA drives.

Step 4: Install the RAID Driver During OS Installation

The RAID driver must be installed during the Windows® XP or Windows® 2000 installation using the F6 installation method. This is required in order to install the operating system onto a hard drive or RAID volume when in RAID mode or onto a hard drive when in AHCI mode.

1. Start Windows Setup by booting from the installation CD.

2. Press <F6> when prompted in the status line with the 'Press F6 if you need to install a third party SCSI or RAID driver' message.

3. Press <S> to "Specify Additional Device".

4. At this point you will be prompted to insert a floppy disk containing the RAID driver. Insert the RAID driver diskette.

5. Locate for the drive where you inserted the diskette then select RAID or AHCI controller that corresponds to your BIOS setup. Press <Enter> to confirm.

You have successfully installed the driver. However you must continue installing the OS. Leave the floppy disk in the floppy drive until the system reboots itself because Windows setup will need to copy the files again from the floppy disk to the Windows installation folders. After Windows setup has copied these files again, remove the floppy diskette so that Windows setup can reboot as needed.

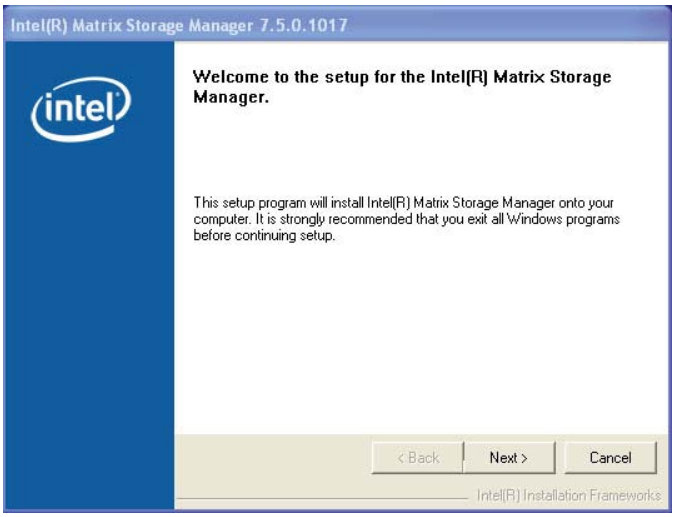
Step 5: Install the Intel Rapid Storage Technology Utility

The Intel Rapid Storage Technology Utility can be installed from within Windows. It allows RAID volume management (create, delete, migrate) from within the operating system. It will also display useful SATA device and RAID volume information. The user interface, tray icon service and monitor service allow you to monitor the current status of the RAID volume and/or SATA drives. It enables enhanced performance and power management for the storage subsystem.

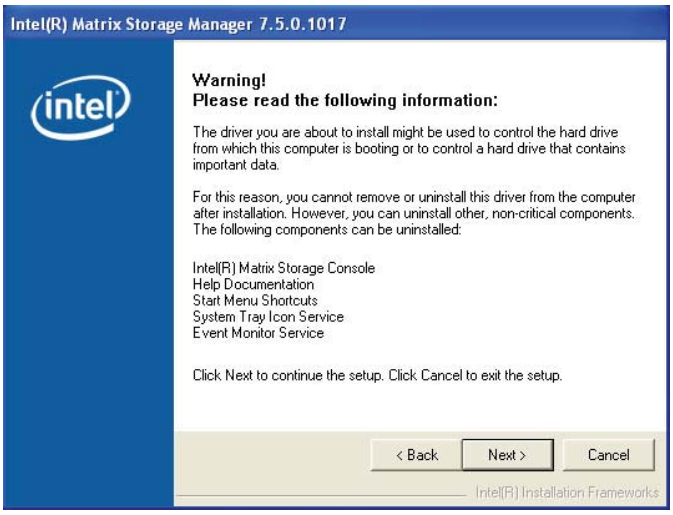
1. Insert the provided CD into an optical drive.

2. Click “Intel Rapid Storage Technology Utility” on the main menu.

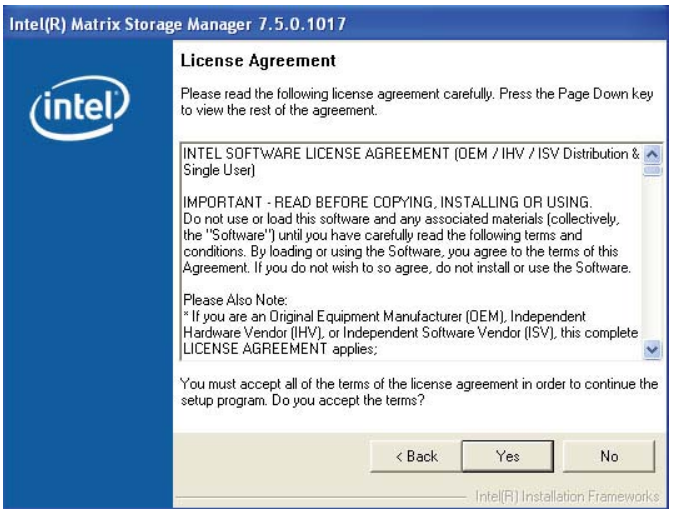
3. Setup is ready to install the utility. Click Next.


Intel(R) Matrix Storage Manager 7.5.0.1017
intel
Welcome to the setup for the Intel(R) Matrix Storage Manager.
This setup program will install Intel(R) Matrix Storage Manager onto your computer. It is strongly recommended that you exit all Windows programs before continuing setup.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

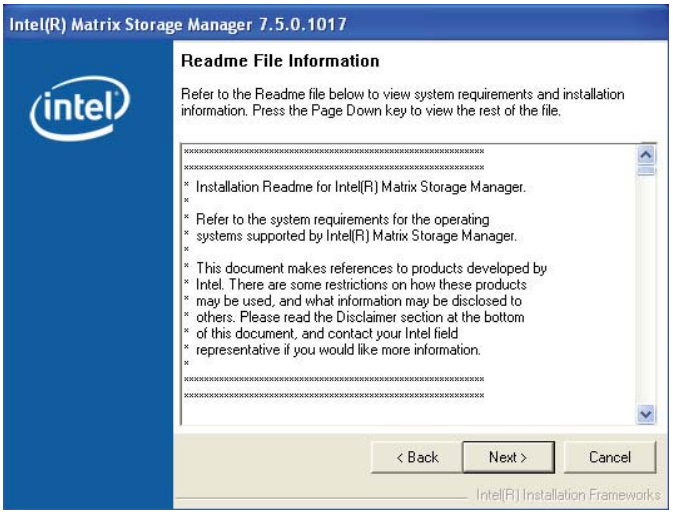
4. Read the warning carefully then click Next.


Intel(R) Matrix Storage Manager 7.5.0.1017
intel
Warning!
Please read the following information:
The driver you are about to install might be used to control the hard drive from which this computer is booting or to control a hard drive that contains important data.
For this reason, you cannot remove or uninstall this driver from the computer after installation. However, you can uninstall other, non-critical components. The following components can be uninstalled:
Intel(R) Matrix Storage Console
Help Documentation
Start Menu Shortcuts
System Tray Icon Service
Event Monitor Service
Click Next to continue the setup. Click Cancel to exit the setup.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

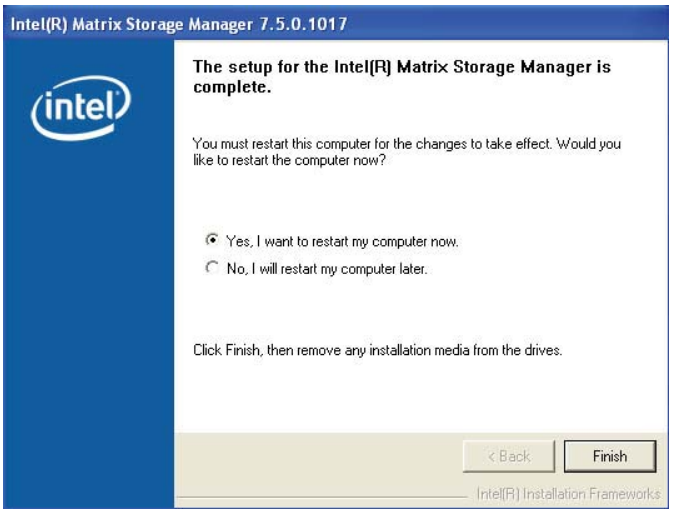
5. Read the license agreement then click Yes.


Intel(R) Matrix Storage Manager 7.5.0.1017
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

6. Go through the readme document to view system requirements and installation information then click Next.


Intel(R) Matrix Storage Manager 7.5.0.1017
Readme File Information
Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
* Installation Readme for Intel(R) Matrix Storage Manager.
* Refer to the system requirements for the operating
* systems supported by Intel(R) Matrix Storage Manager.
* This document makes references to products developed by
* Intel. There are some restrictions on how these products
* may be used, and what information may be disclosed to
* others. Please read the Disclaimer section at the bottom
* of this document, and contact your Intel field
* representative if you would like more information.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

7. Click “Yes, I want to restart my computer now” then click Finish.


Intel(R) Matrix Storage Manager 7.5.0.1017
The setup for the Intel(R) Matrix Storage Manager is complete.
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Click Finish, then remove any installation media from the drives.
< Back
Finish
Intel(R) Installation Frameworks

Chapter 6 - Intel AMT Settings

Overview

Intel Active Management Technology (Intel® AMT) combines hardware and software solution to provide maximum system defense and protection to networked systems.

The hardware and software information are stored in non-volatile memory. With its built-in manageability and latest security applications, Intel® AMT provides the following functions.

- Discover

  Allows remote access and management of networked systems even while PCs are powered off; significantly reducing desk-side visits.

- Repair

  Remotely repair systems after OS failures. Alerting and event logging help detect problems quickly to reduce downtime.

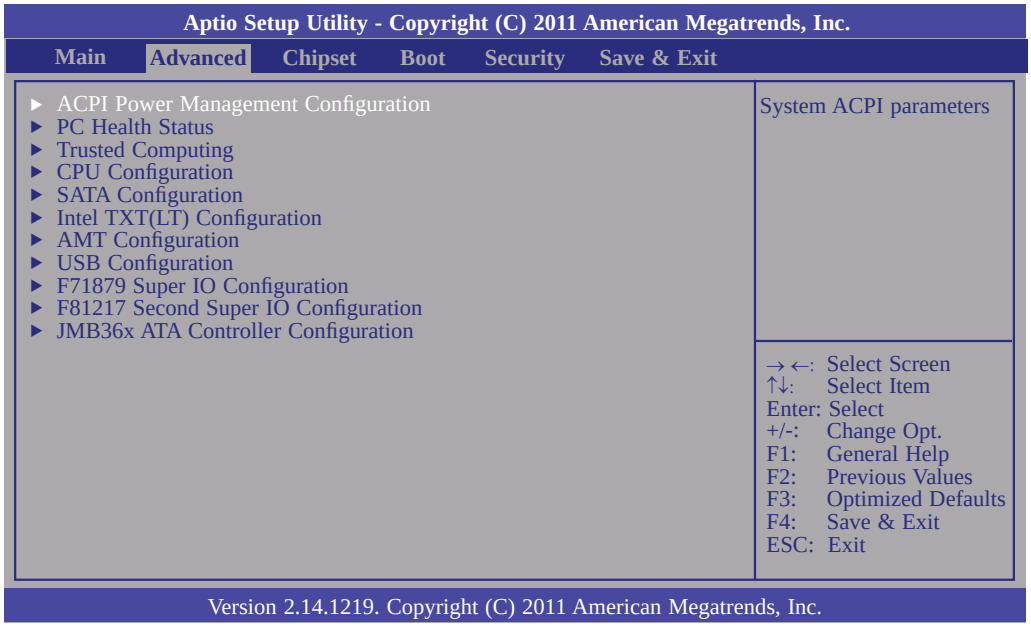
- Protect

  Intel AMT's System Defense capability remotely updates all systems with the latest security software. It protects the network from threats at the source by proactively blocking incoming threats, reactively containing infected clients before they impact the network, and proactively alerting when critical software agents are removed.

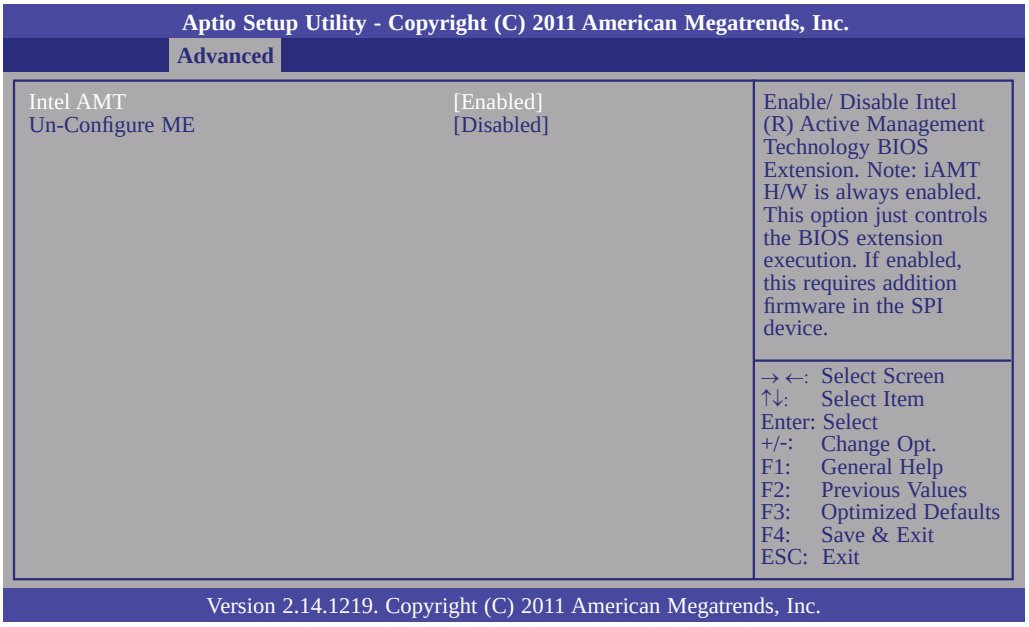
Enable Intel® AMT in the AMI BIOS

1. Power-on the system then press <Del> to enter the main menu of the AMI BIOS.

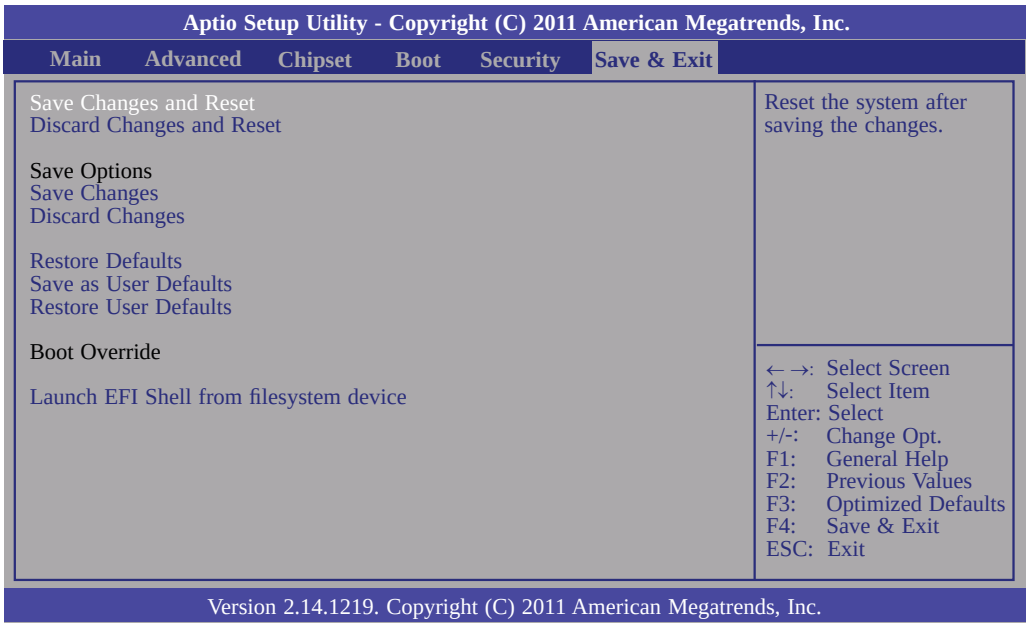
2. In the **Advanced** menu, select **AMT Configuration**.



3. In the **Advanced** menu, select **Enable** in the **AMT** field.

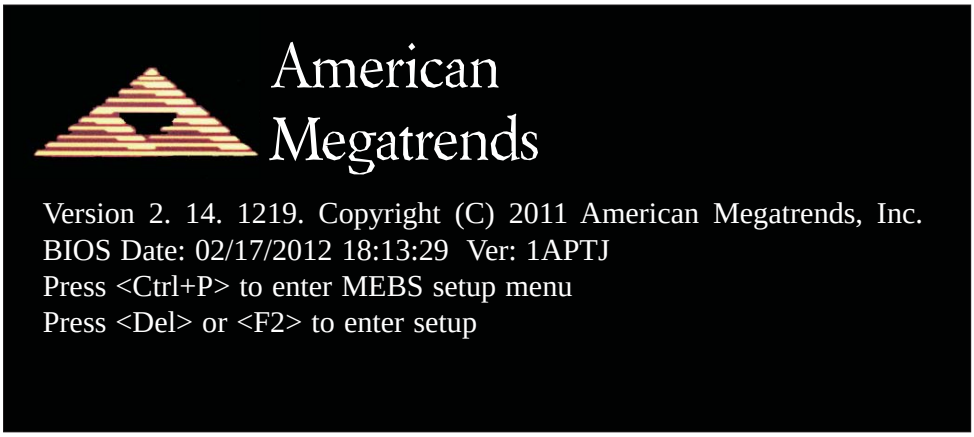

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced
Intel AMT
[Enabled]
Un-Configure ME
[Disabled]
Enable/ Disable Intel (R) Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires addition firmware in the SPI device.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

4. In the **Save & Exit** menu, select **Save Changes and Reset** then select **OK**.

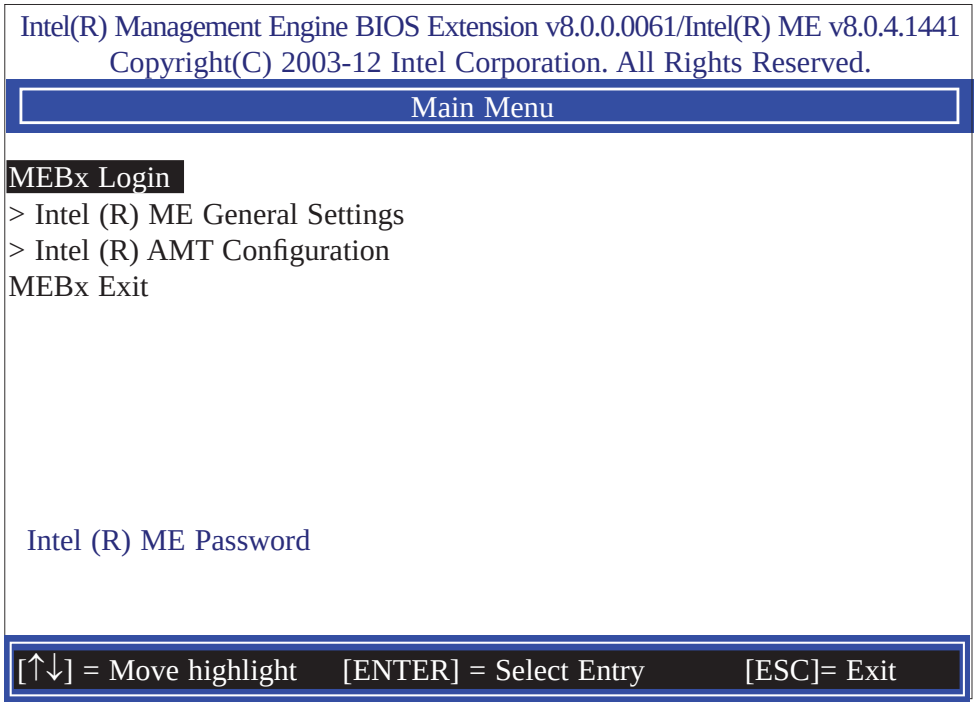


Enable Intel® AMT in the Intel® Management Engine BIOS Extension (MEBX) Screen

1. When the system reboots, the following message will be displayed. Press **<Ctrl-P>** as soon as the message is displayed; as this message will be displayed for only a few seconds.

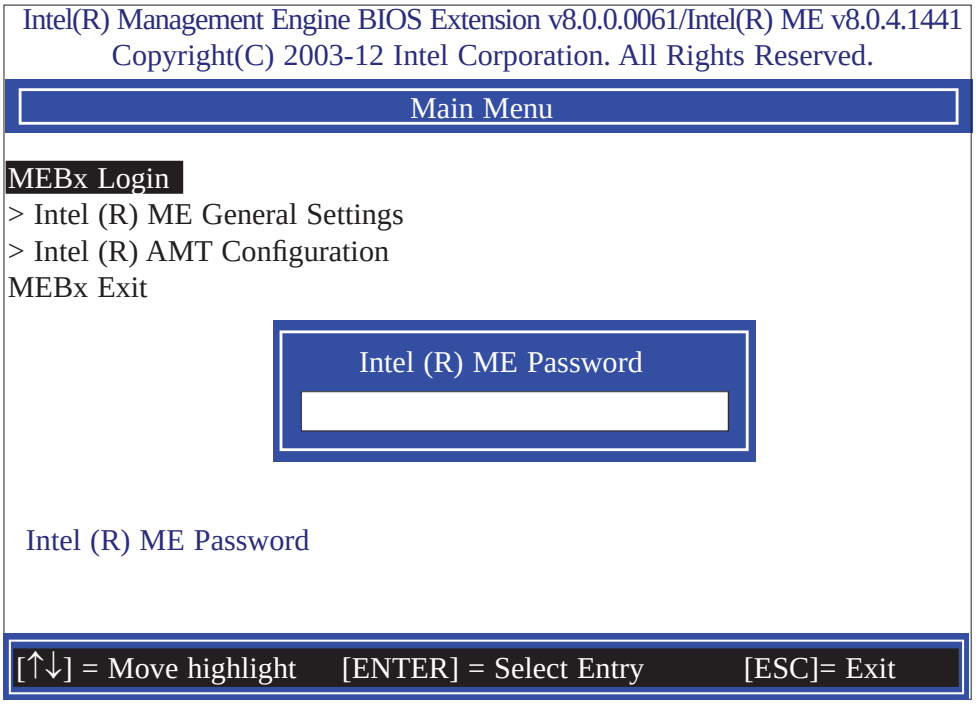

American
Megatrends
Version 2. 14. 1219. Copyright (C) 2011 American Megatrends, Inc.
BIOS Date: 02/17/2012 18:13:29 Ver: 1APTJ
Press <Ctrl+P> to enter MEBS setup menu
Press <Del> or <F2> to enter setup

2. You will be prompted for a password. The default password is "**admin**". Enter the default password in the space provided under Intel(R) ME Password then press Enter.

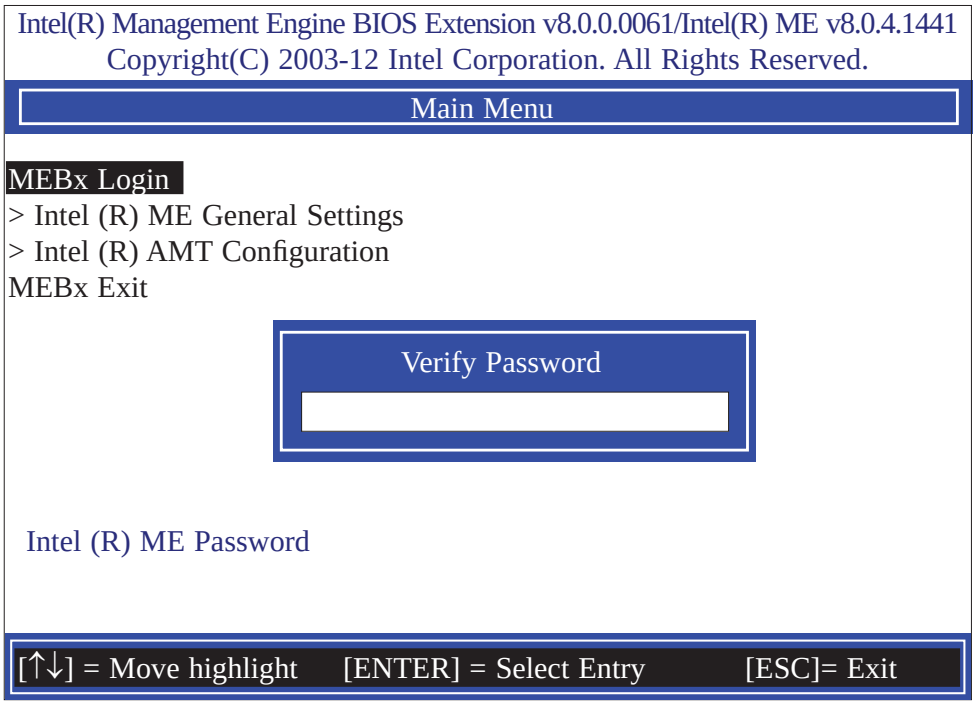

Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
Main Menu
MEBx Login
> Intel (R) ME General Settings
> Intel (R) AMT Configuration
MEBx Exit
Intel (R) ME Password
[↑↓] = Move highlight
[ENTER] = Select Entry
[ESC]= Exit

3. Enter a new password in the space provided under Intel(R) ME New Password then press Enter. The password must include:

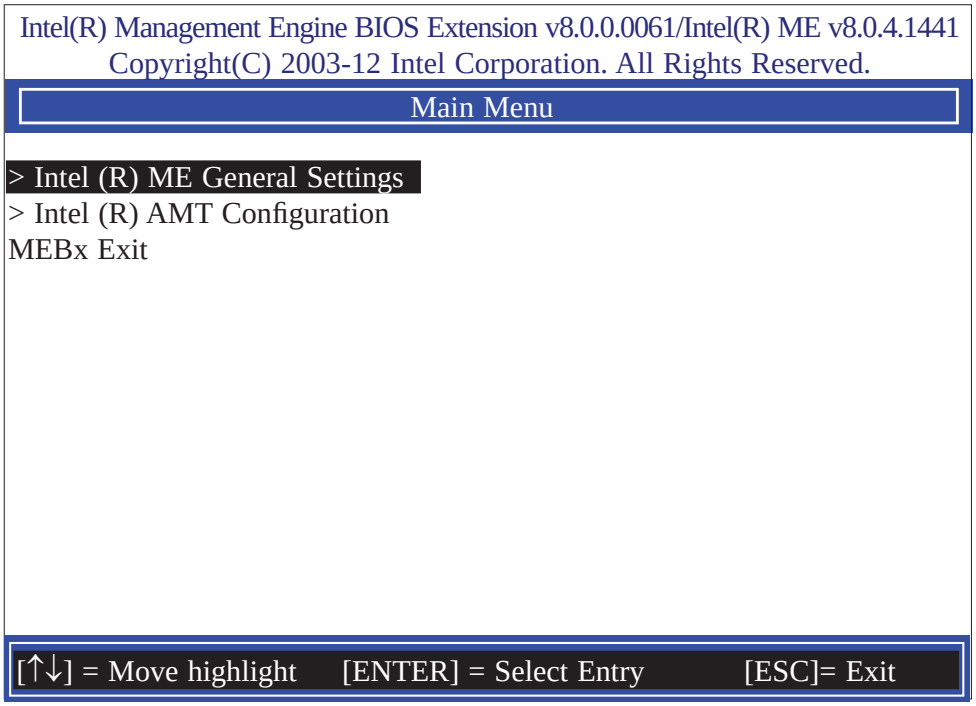
- 8-32 characters
- Strong 7-bit ASCII characters excluding **:** **,** and **"** characters
- At least one digit character (0, 1, ...9)
- At least one 7-bit ASCII non alpha-numeric character, above 0x20, (e.g. !, $, ;)
- Both lower case and upper case characters


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
Main Menu
MEBx Login
> Intel (R) ME General Settings
> Intel (R) AMT Configuration
MEBx Exit
Intel (R) ME Password
Intel (R) ME Password
[↑↓] = Move highlight
[ENTER] = Select Entry
[ESC]= Exit

4. You will be asked to verify the password. Enter the same new password in the space provided under Verify Password then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
Main Menu
MEBx Login
> Intel (R) ME General Settings
> Intel (R) AMT Configuration
MEBx Exit
Verify Password
Intel (R) ME Password
[↑↓] = Move highlight [ENTER] = Select Entry [ESC]= Exit

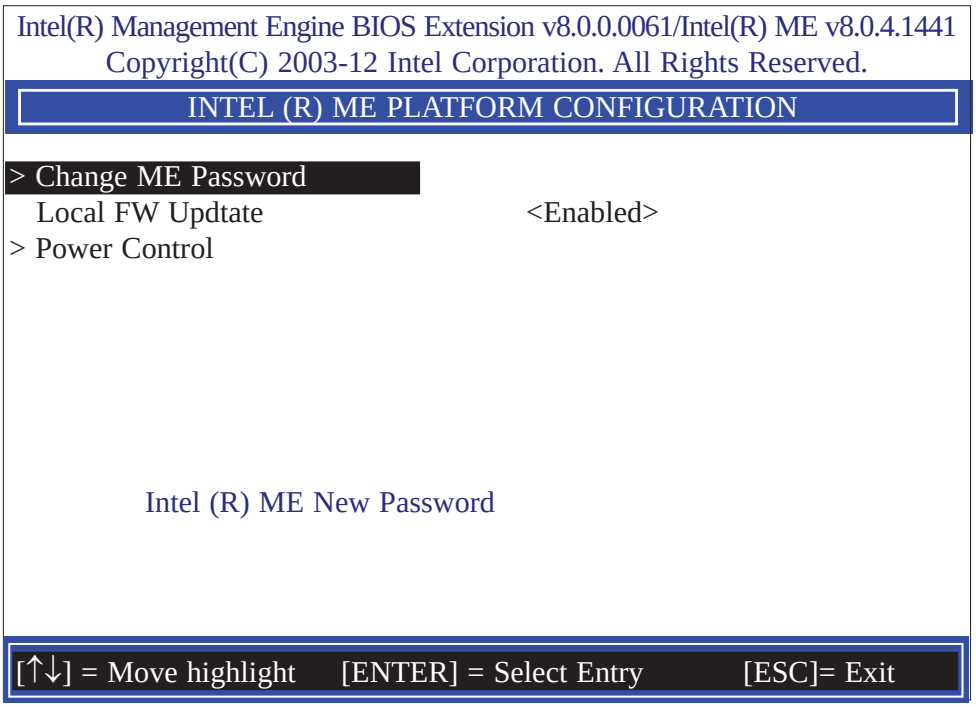
5. Select **Intel(R) ME General Settings** then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
Main Menu
> Intel (R) ME General Settings
> Intel (R) AMT Configuration
MEBx Exit
[↑↓] = Move highlight [ENTER] = Select Entry [ESC]= Exit

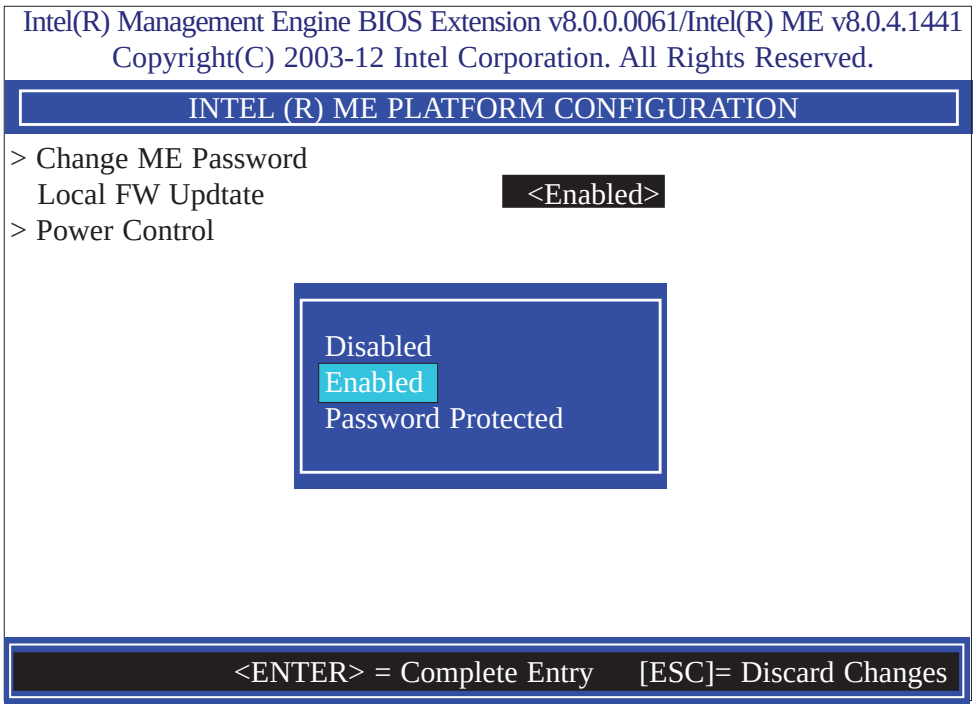
6. Select **Change Intel(R) ME Password** then press Enter.

   You will be prompted for a password. The default password is "**admin**". Enter the default password in the space provided under Intel(R) ME New Password then press Enter.

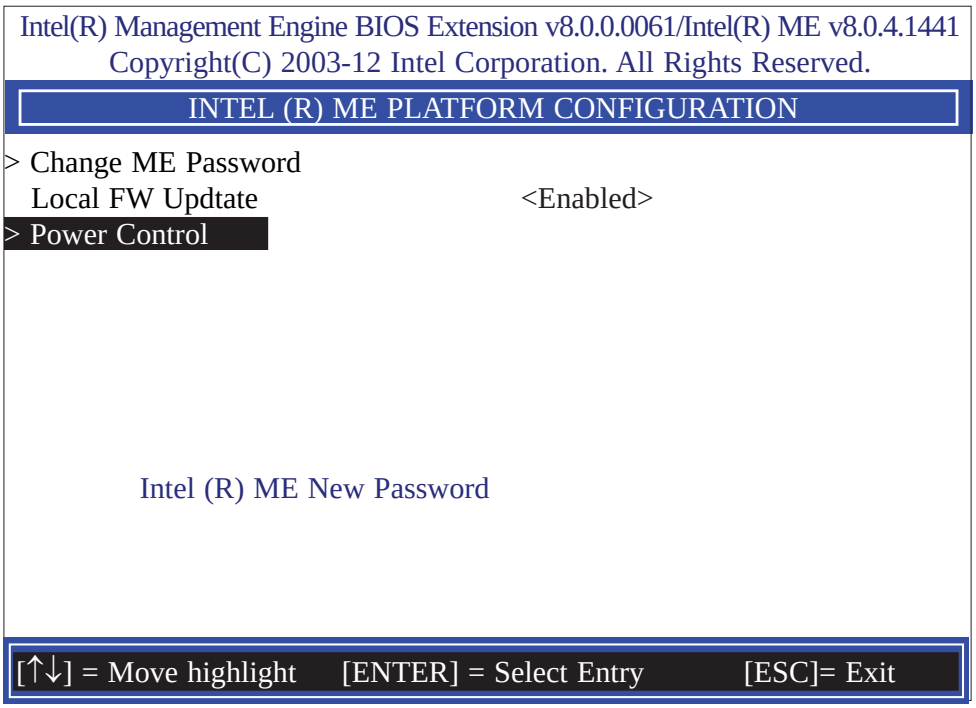
   - 8-32 characters
   - Strong 7-bit ASCII characters excluding **:** , and **"** characters
   - At least one digit character (0, 1, ...9)
   - At least one 7-bit ASCII non alpha-numeric character, above 0x20, (e.g. !, $, ;)
   - Both lower case and upper case characters


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) ME PLATFORM CONFIGURATION
> Change ME Password
Local FW Updtate
<Enabled>
> Power Control
Intel (R) ME New Password
[↑↓] = Move highlight
[ENTER] = Select Entry
[ESC]= Exit

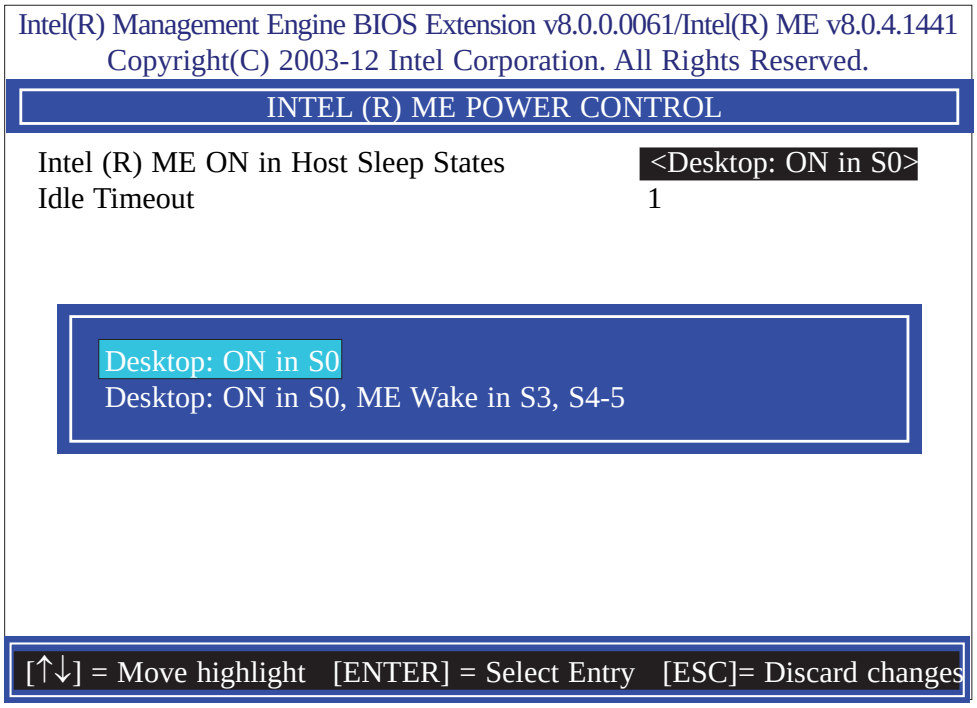
7. Select **Local FW Update** then press Enter. Select **Enabled** then press Enter.



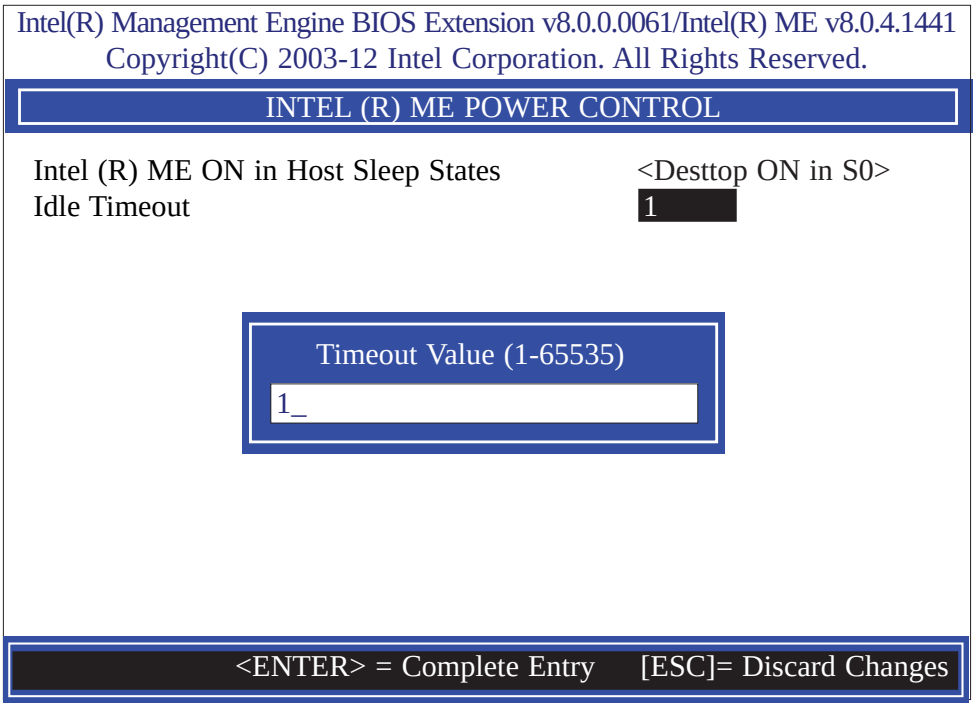
8. In the **Intel(R) ME Platform Configuration** menu, select **Power Control** then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) ME PLATFORM CONFIGURATION
> Change ME Password
Local FW Updtate
<Enabled>
> Power Control
Intel (R) ME New Password
[↑↓] = Move highlight
[ENTER] = Select Entry
[ESC]= Exit

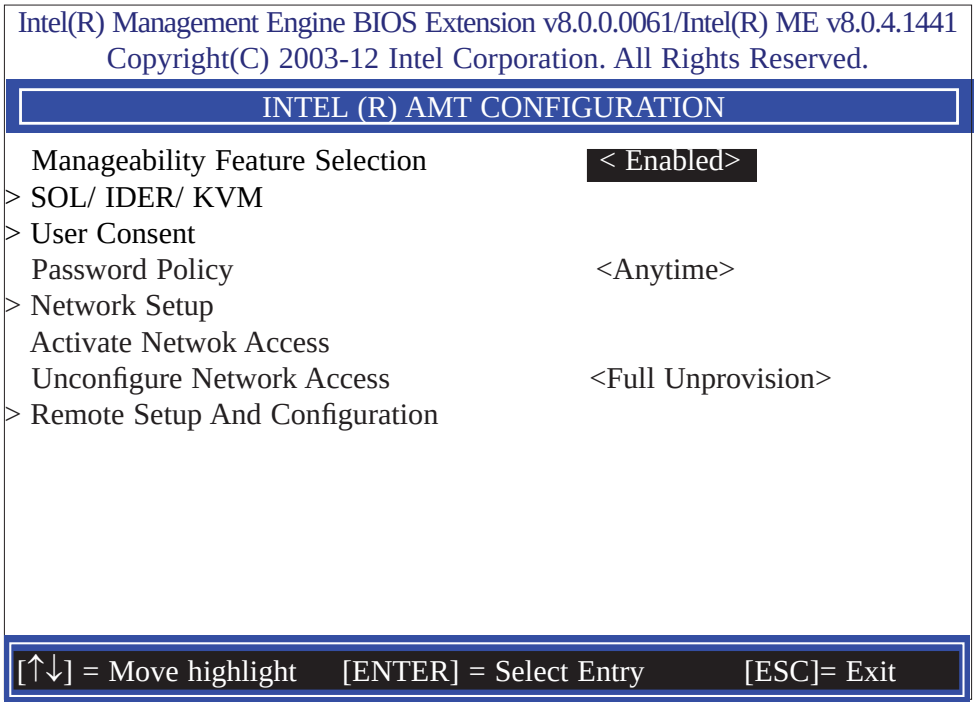
9. In the **Intel(R) ME Power Control** menu, select **Intel(R) ME ON in Host Sleep States** then press Enter. Select an option then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) ME POWER CONTROL
Intel (R) ME ON in Host Sleep States
<Desktop: ON in S0>
Idle Timeout
1
Desktop: ON in S0
Desktop: ON in S0, ME Wake in S3, S4-5
[↑↓] = Move highlight [ENTER] = Select Entry [ESC]= Discard changes

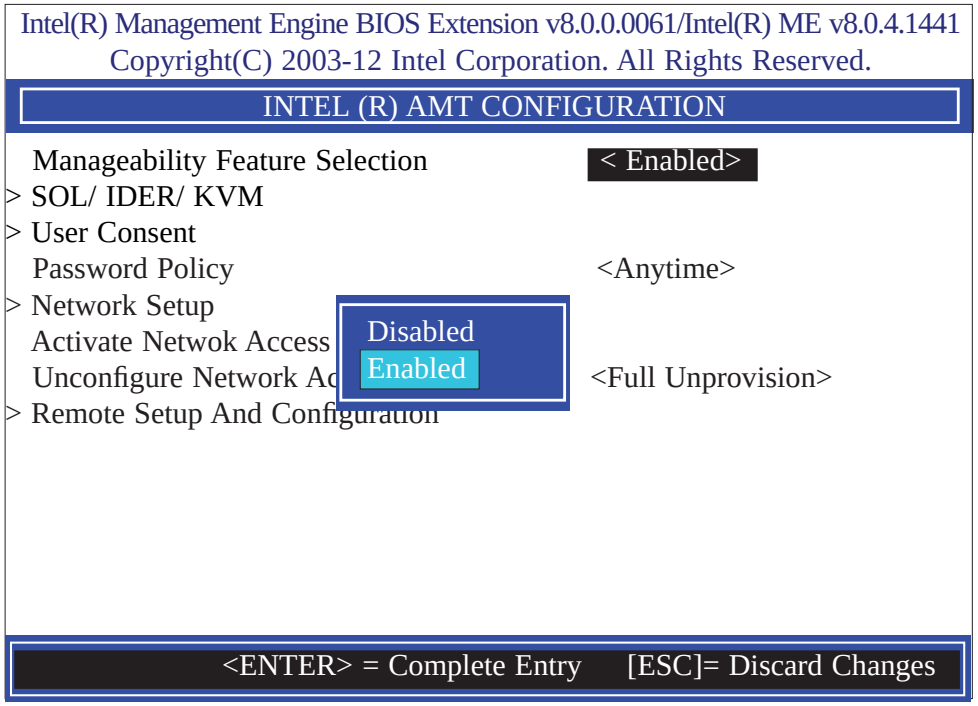
10. In the **Intel(R) ME Power Control** menu, select **Idle Timeout** then press Enter. Enter the timeout value.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) ME POWER CONTROL
Intel (R) ME ON in Host Sleep States
<Desttop ON in S0>
Idle Timeout
1
Timeout Value (1-65535)
1_
<ENTER> = Complete Entry [ESC]= Discard Changes

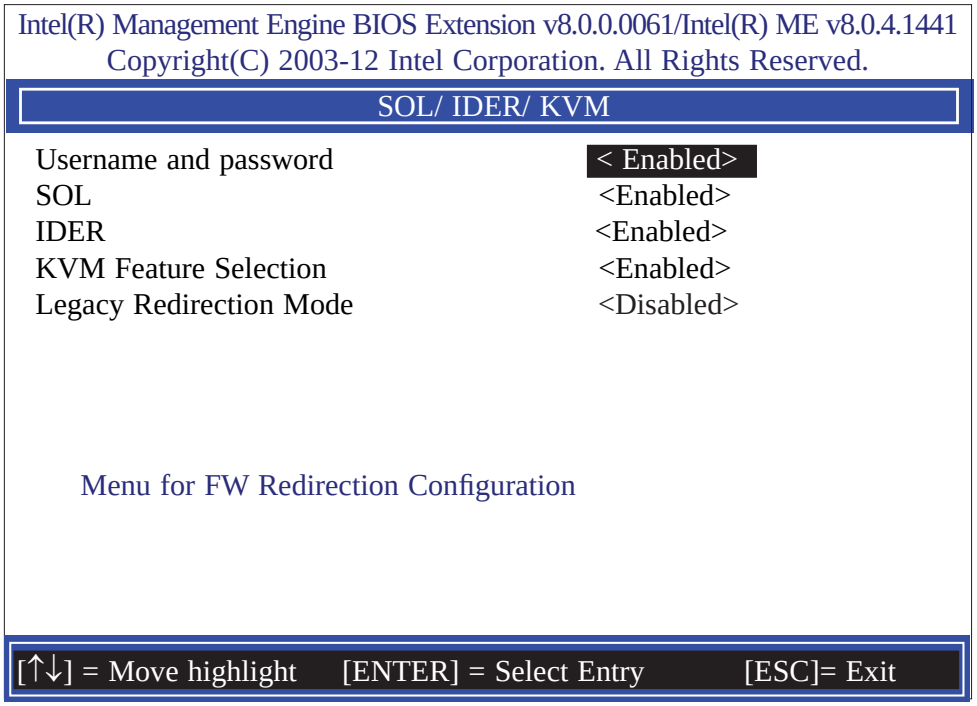
11. Select Previous Menu until you return to the **Main Menu**. Select **Intel(R) AMT Configuration** then press Enter.



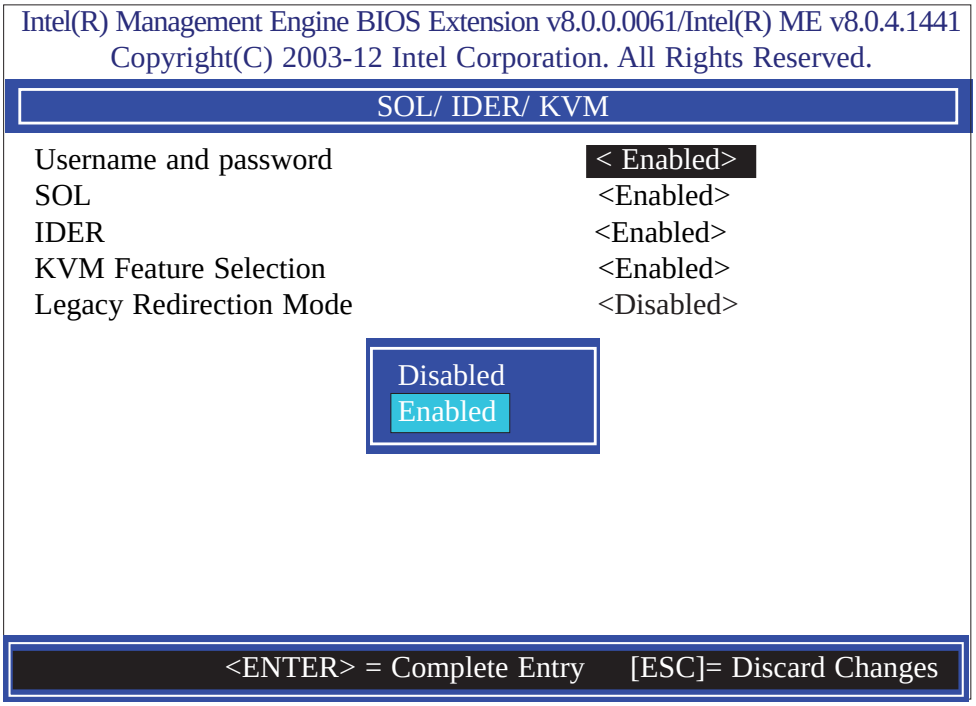
12. In the **Intel(R) AMT Configuration** menu, select **Manageability Feature Selection** then press Enter. Select disabled then press Enter.



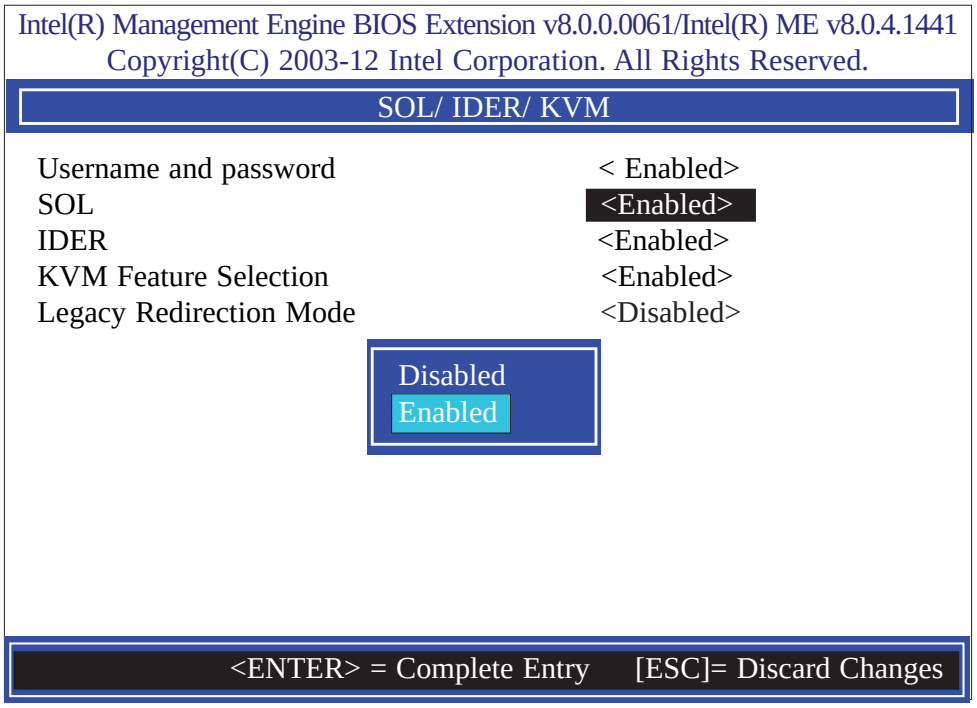
13. In the **Intel(R) AMT Configuration** menu, select **SOL/IDER/KVM** then press Enter.



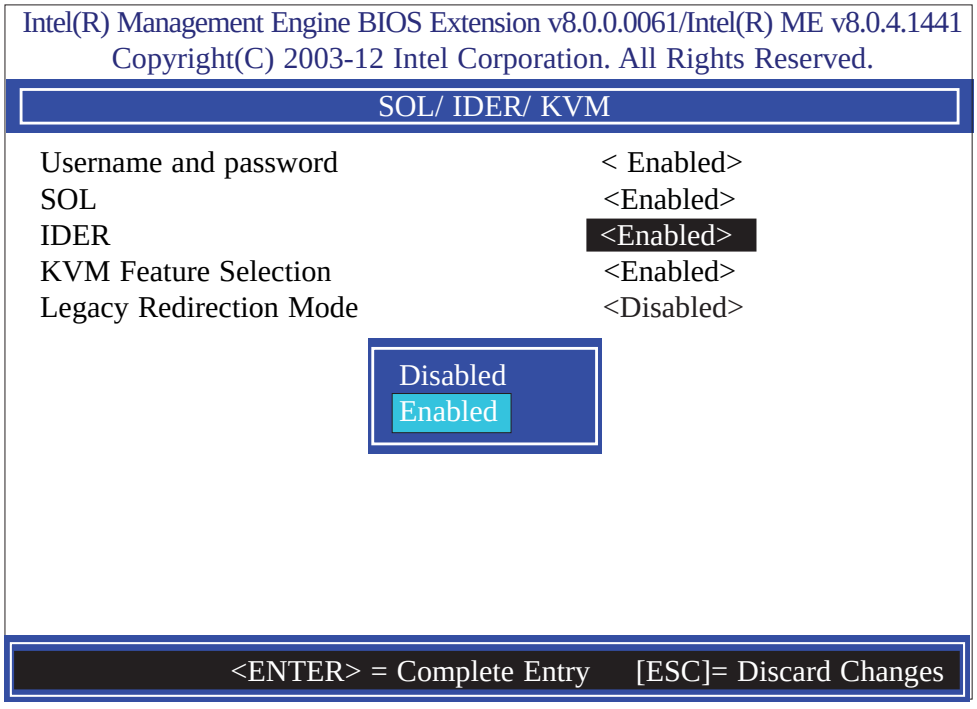
14. In the **SOL/IDER/KVM** menu, select **Username and Password** then press Enter. Select disabled then press Enter.



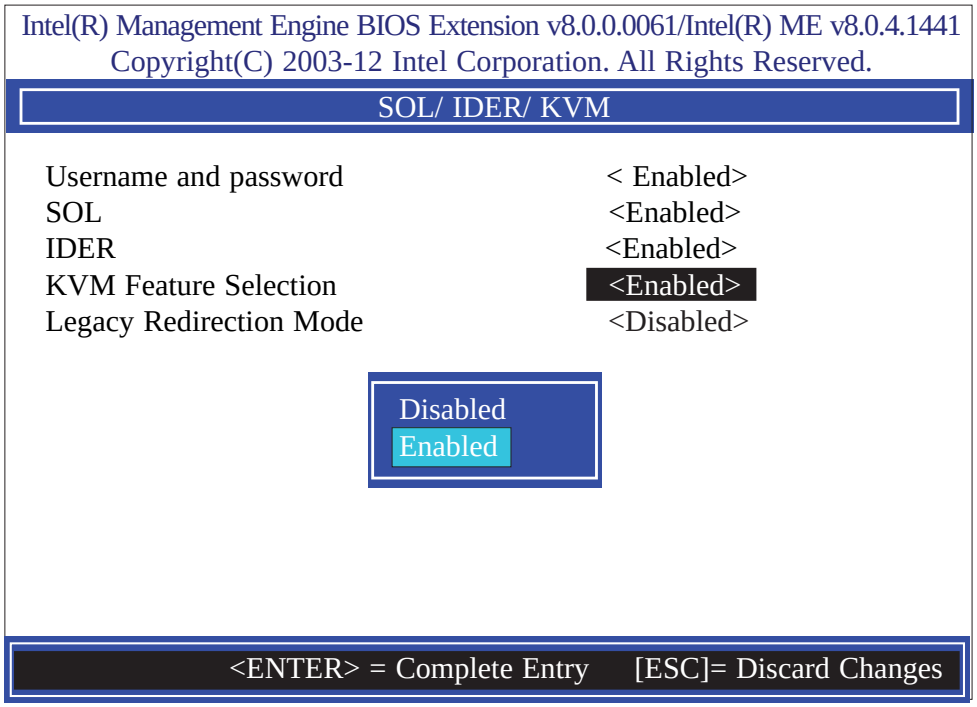
15. In the **SOL/IDER/KVM** menu, select **SOL** then press Enter. Select disabled then press Enter.



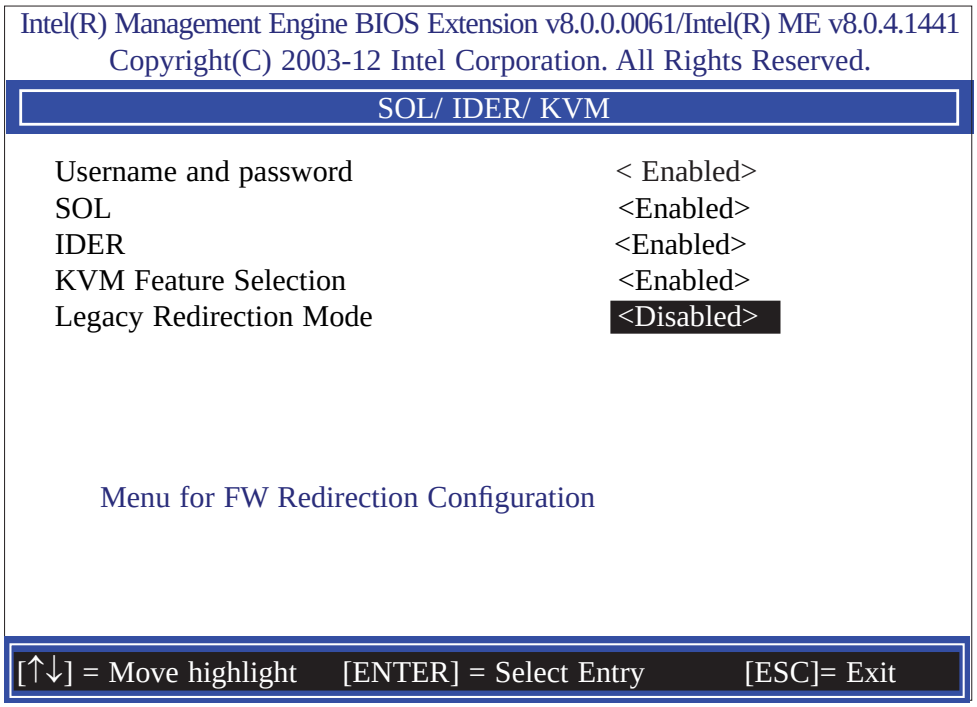
16. In the **SOL/IDER/KVM** menu, select **IDER** then press Enter. Select disabled then press Enter.



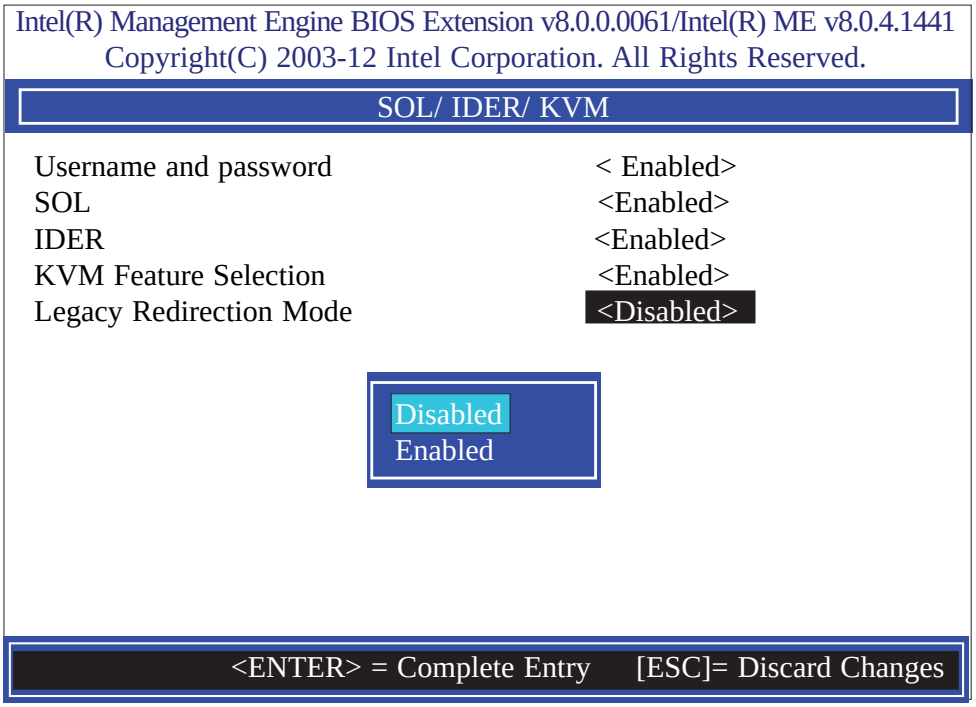
17. In the **SOL/IDER/KVM** menu, select **KVM** then press Enter. Select disabled then press Enter.



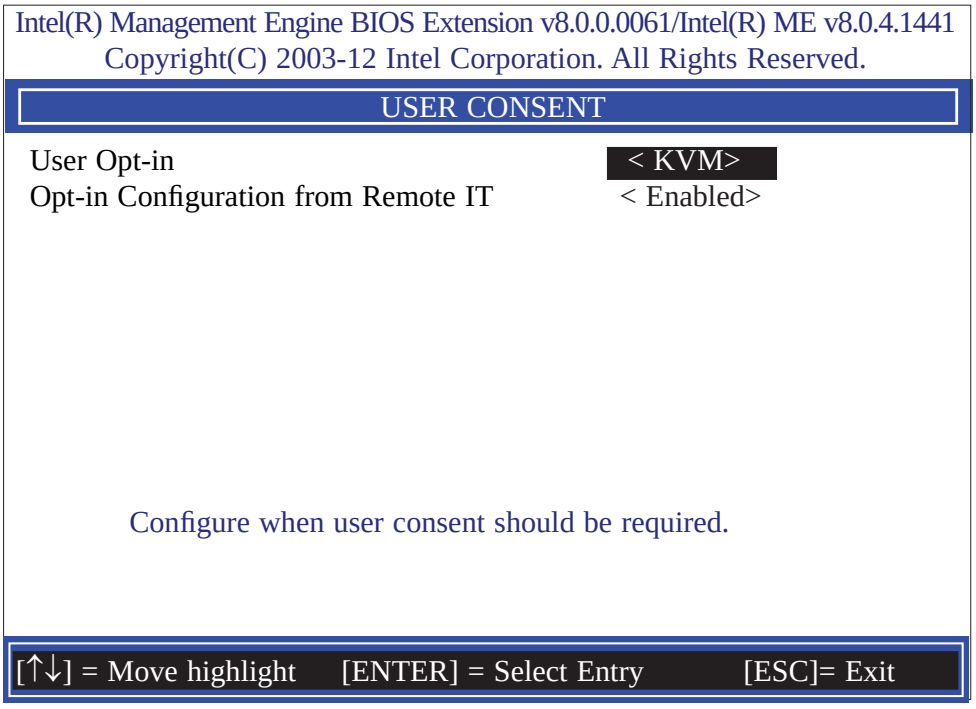
18. In the **SOL/IDER/KVM** menu, select **Legacy Redirection Mode** then press Enter.



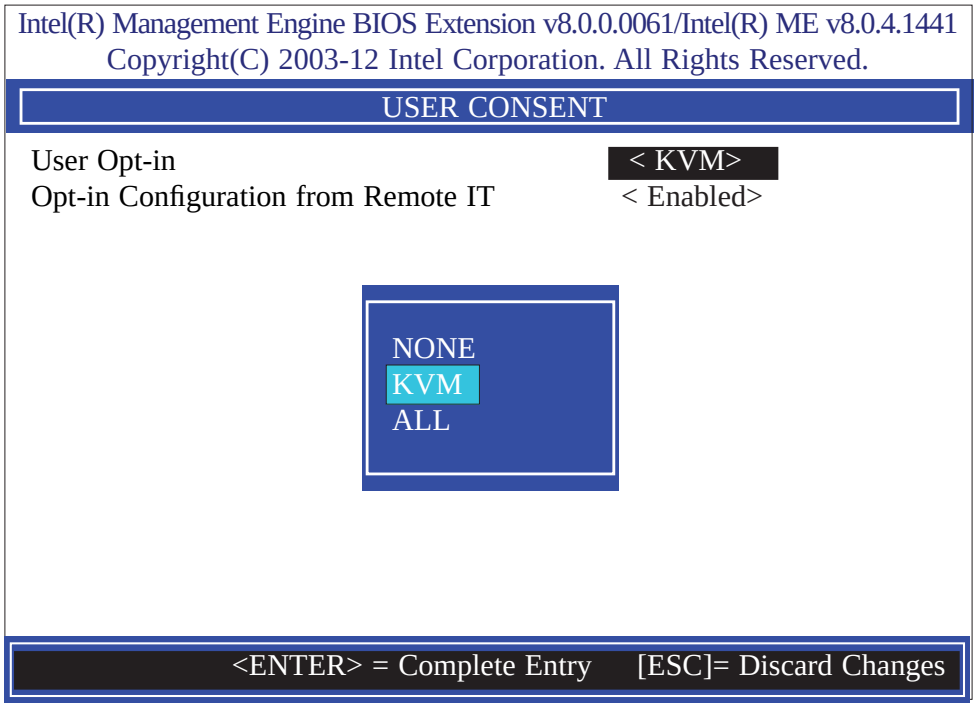
19. Select Enabled then press Enter.



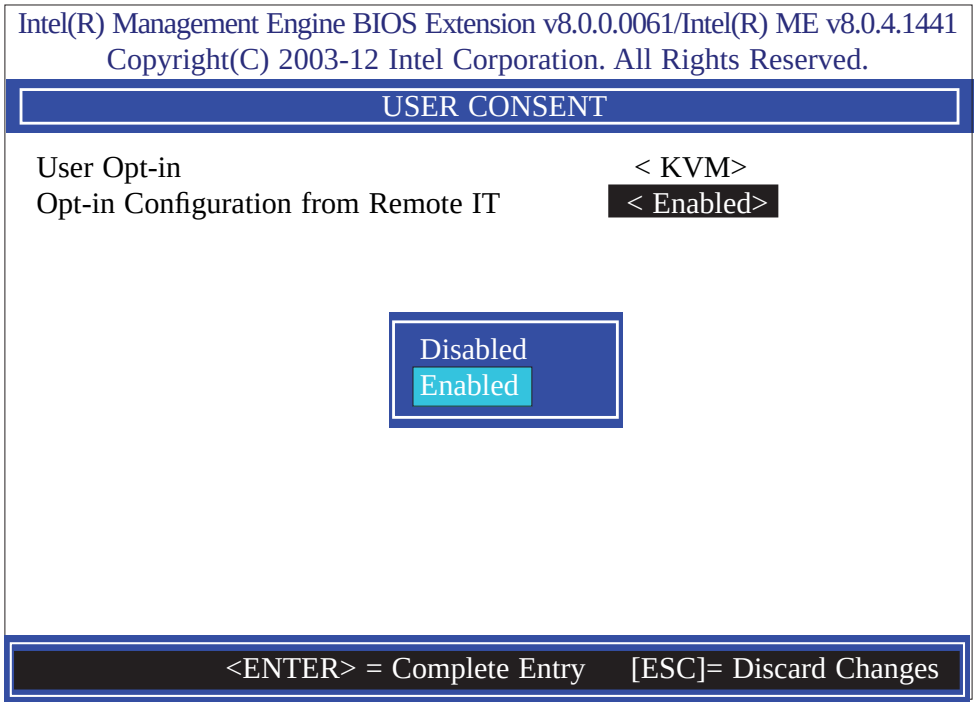
20. Select Previous Menu until you return to the **Intel(R) AMT Configuration** menu. Select **User Consent** then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
USER CONSENT
User Opt-in
< KVM>
Opt-in Configuration from Remote IT
< Enabled>
Configure when user consent should be required.
[↑↓] = Move highlight
[ENTER] = Select Entry
[ESC]= Exit

21. In the **User Consent Configuration** menu, select **User Opt-in** then press Enter. Select **None** then press Enter.

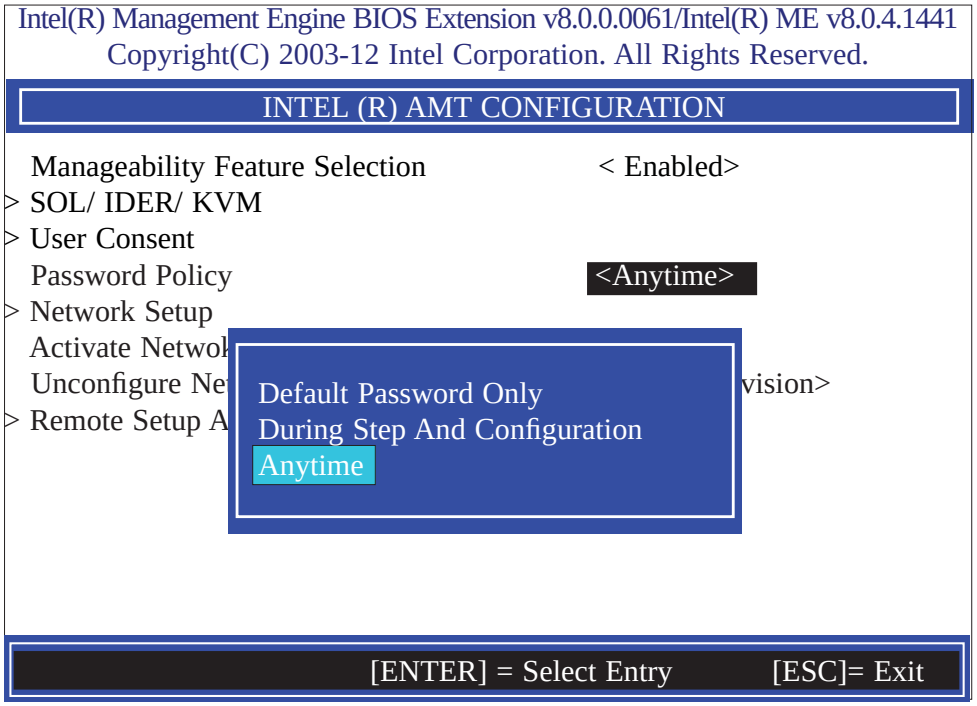


22. In the **User Consent Configuration** menu, select **Opt-in Configurable from Remote IT** then press Enter. Select **Disable Remote Control of KVM Opt-in Policy** then press Enter.

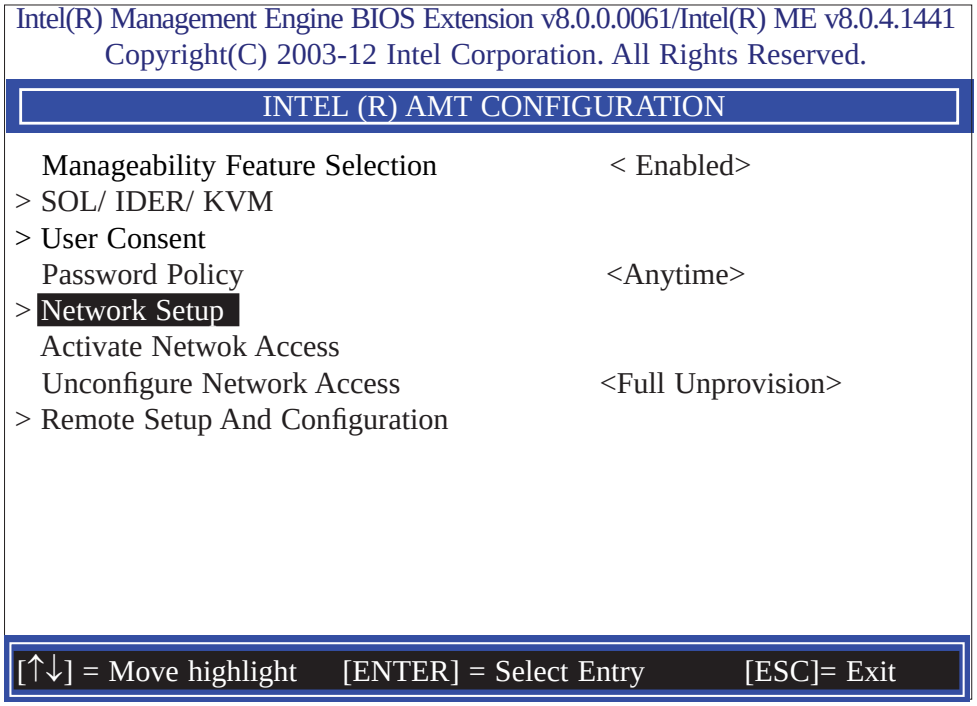


23. Select Previous Menu until you return to the **Intel(R) AMT Configuration** menu. Select **Password Policy** then press Enter.

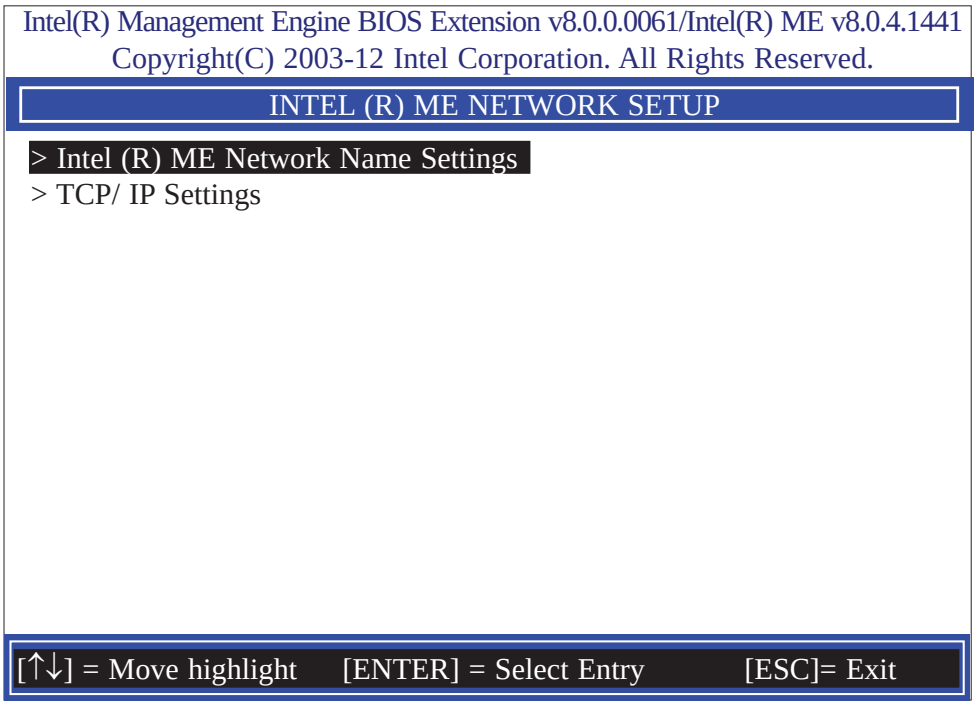
You may choose to use a password only during setup and configuration or to use a password anytime the system is being accessed.



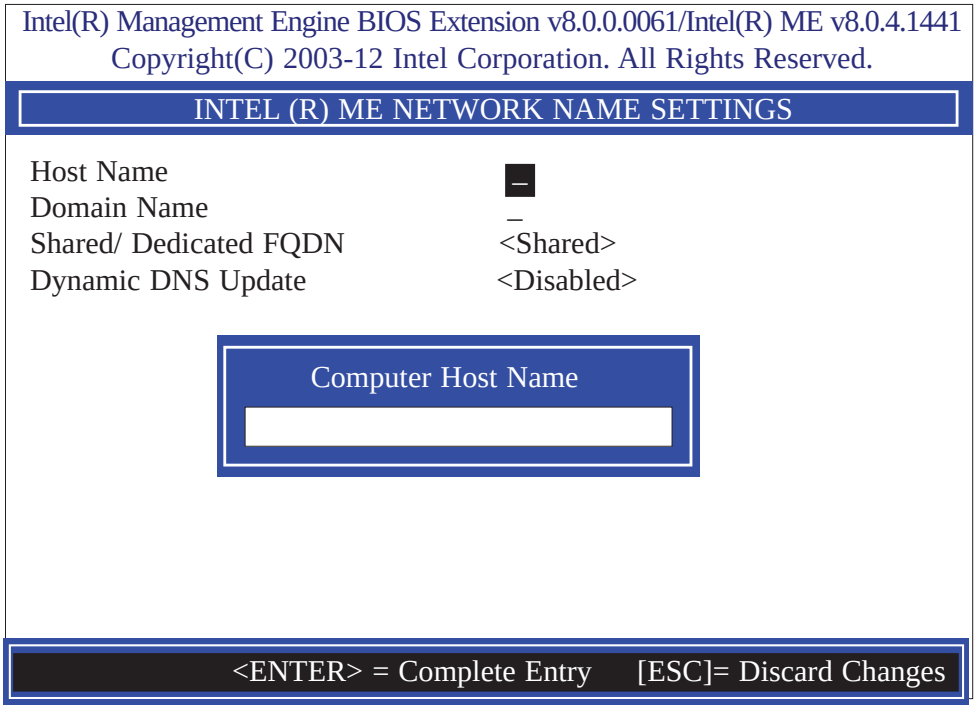
24. In the **Intel(R) AMT Configuration** menu, select **Network Setup** then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) AMT CONFIGURATION
Manageability Feature Selection < Enabled>
> SOL/ IDER/ KVM
> User Consent
Password Policy <Anytime>
> Network Setup
Activate Netwok Access
Unconfigure Network Access <Full Unprovision>
> Remote Setup And Configuration
[↑↓] = Move highlight [ENTER] = Select Entry [ESC]= Exit

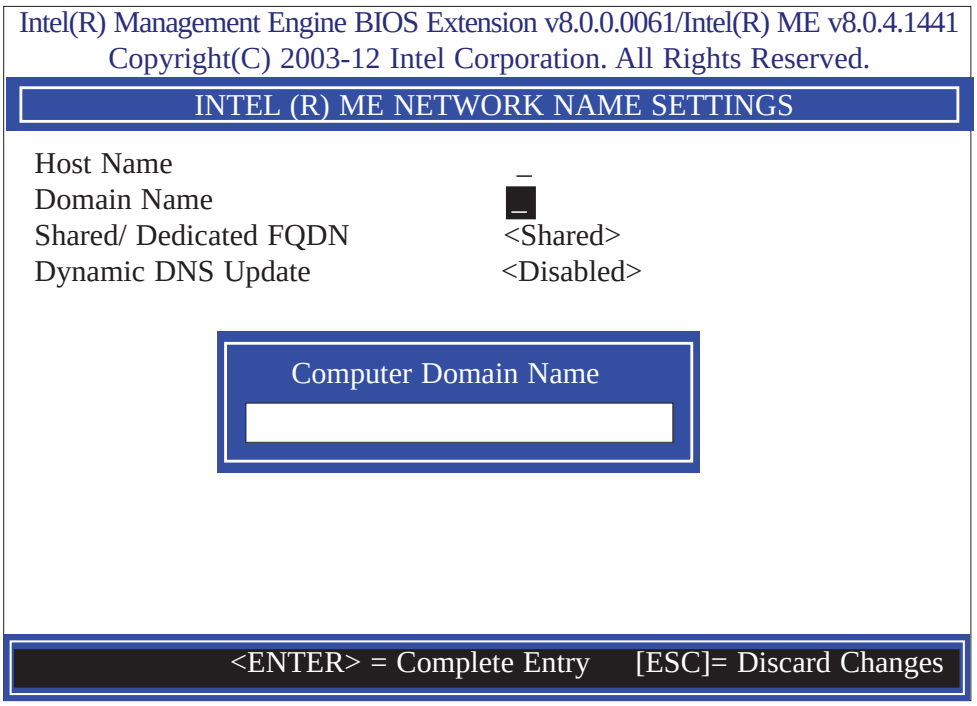
25. In the **Intel(R) Network Setup** menu, select **Intel(R) ME Network Name Settings** then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) ME NETWORK SETUP
> Intel (R) ME Network Name Settings
> TCP/ IP Settings
[↑↓] = Move highlight
[ENTER] = Select Entry
[ESC]= Exit

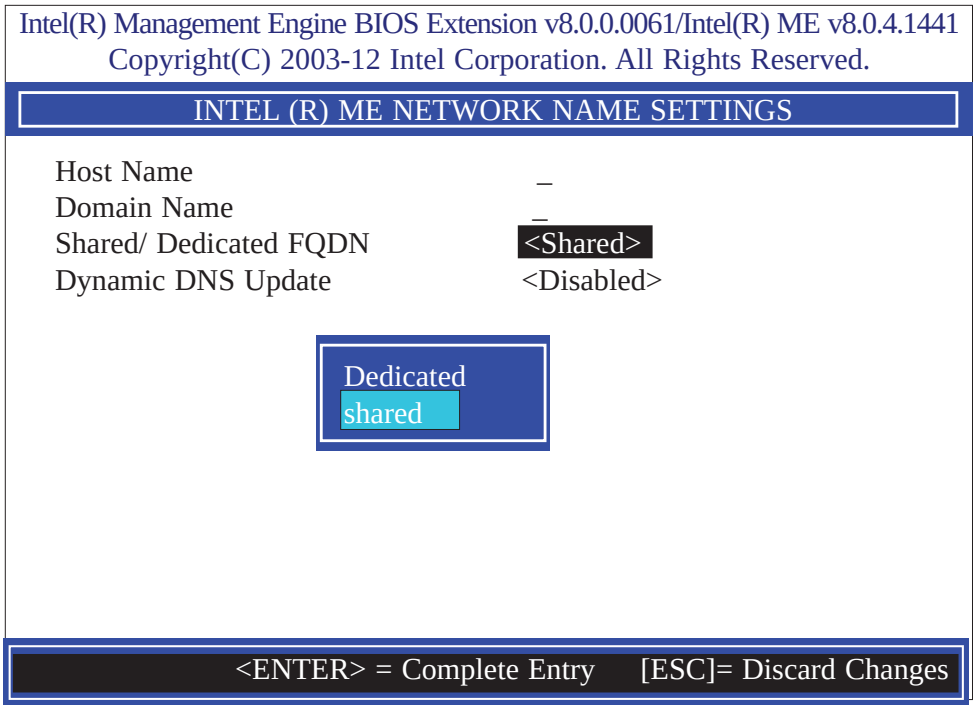
26. In the **Intel(R) ME Network Name Settings** menu, select **Host Name** then press Enter. Enter the computer's host name then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) ME NETWORK NAME SETTINGS
Host Name
Domain Name
Shared/ Dedicated FQDN
<Shared>
Dynamic DNS Update
<Disabled>
Computer Host Name
<ENTER> = Complete Entry
[ESC]= Discard Changes

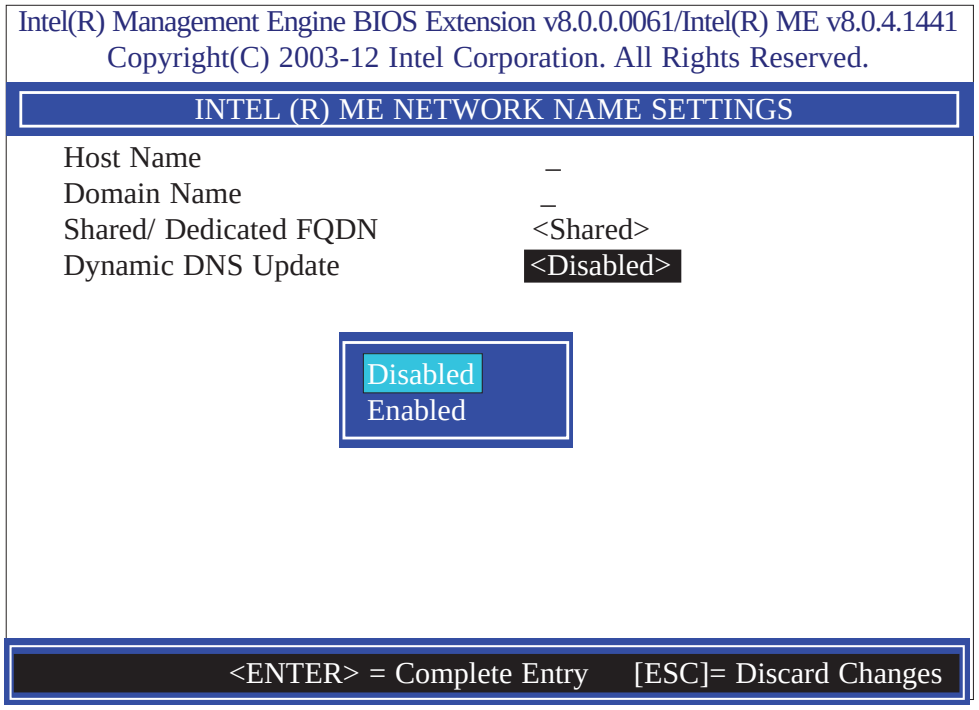
27. Select **Domain Name** then press Enter. Enter the computer's domain name then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) ME NETWORK NAME SETTINGS
Host Name
Domain Name
Shared/ Dedicated FQDN
<Shared>
Dynamic DNS Update
<Disabled>
Computer Domain Name
<ENTER> = Complete Entry
[ESC]= Discard Changes

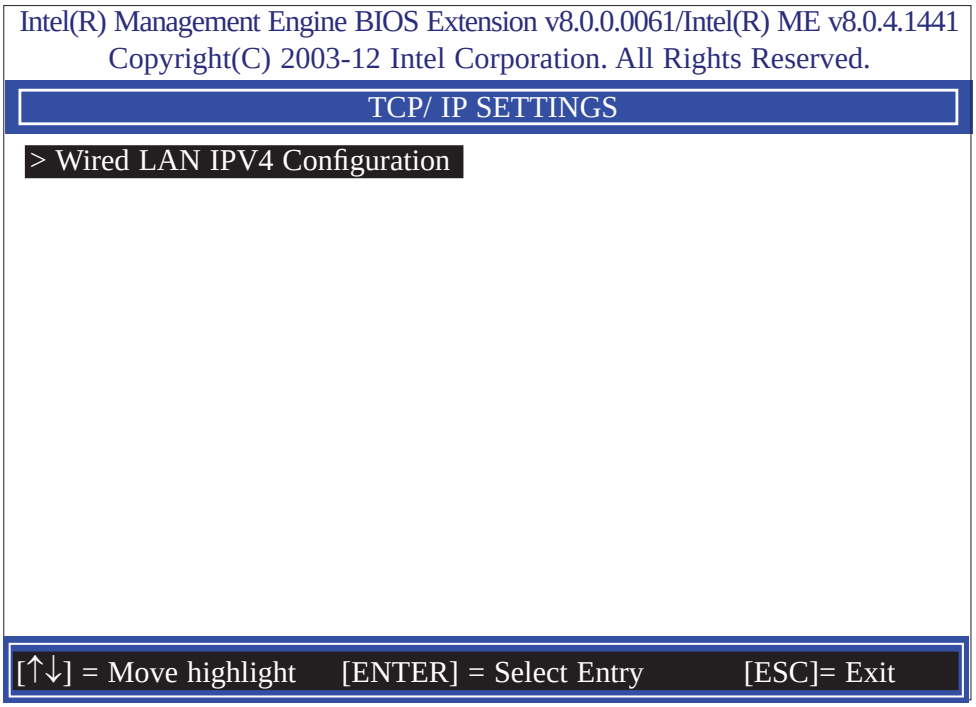
28. Select **Shared/Dedicated FQDN** then press Enter. Select Shared or Dedicated then press Enter.



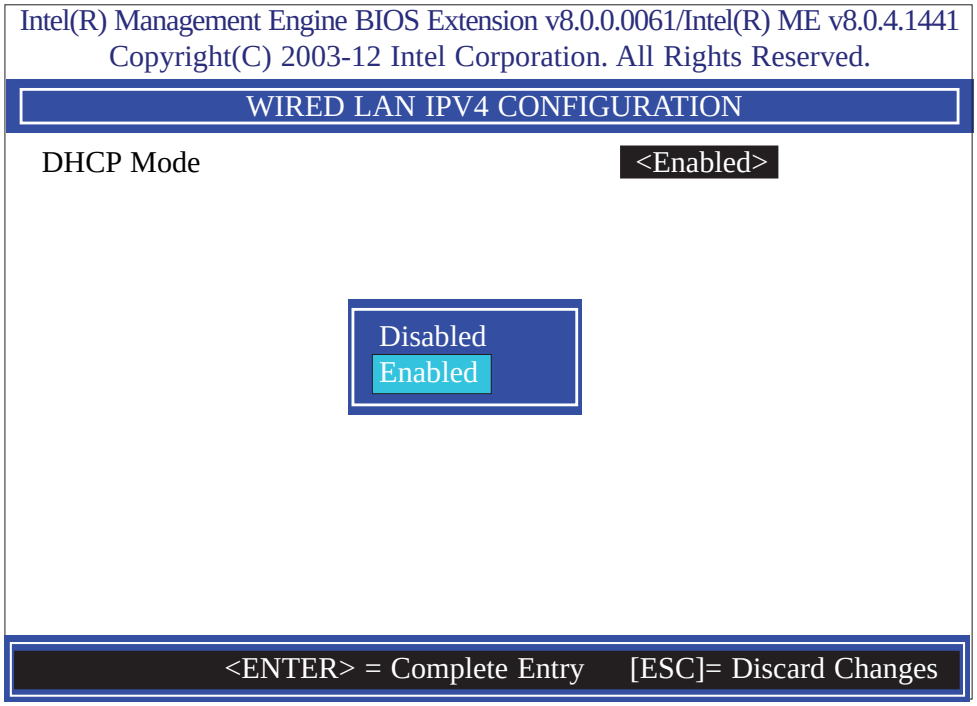
29. Select **Dynamic DNS Update** then press Enter. Select Enabled or Disabled then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) ME NETWORK NAME SETTINGS
Host Name _
Domain Name _
Shared/ Dedicated FQDN <Shared>
Dynamic DNS Update <Disabled>
Disabled
Enabled
<ENTER> = Complete Entry [ESC]= Discard Changes

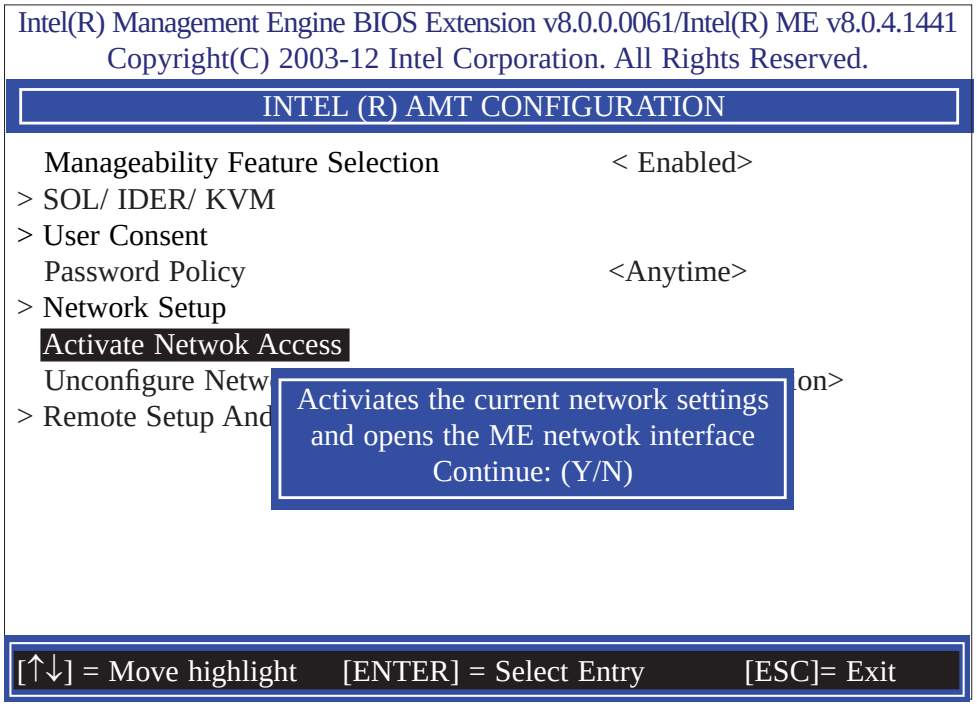
30. Select Previous Menu until you return to the **Intel(R) ME Network Setup** menu. Select **TCP/IP Settings** then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
TCP/ IP SETTINGS
> Wired LAN IPV4 Configuration
[↑↓] = Move highlight [ENTER] = Select Entry [ESC]= Exit

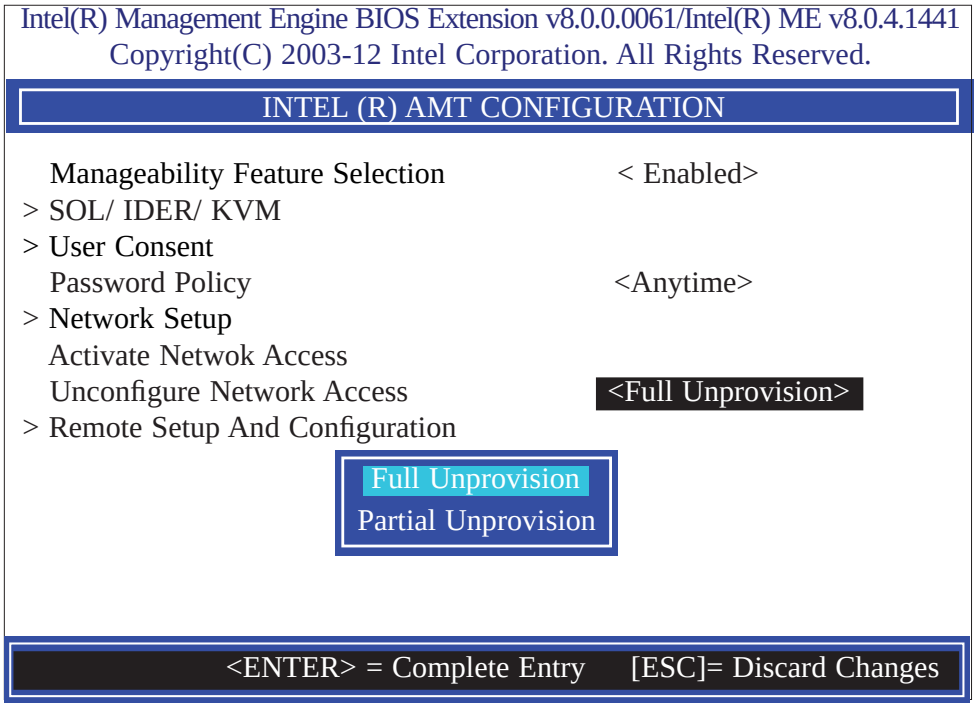
31. In the **TCP/IP Settings** menu, select **Wired LAN IPV4 Configuration** then press Enter.



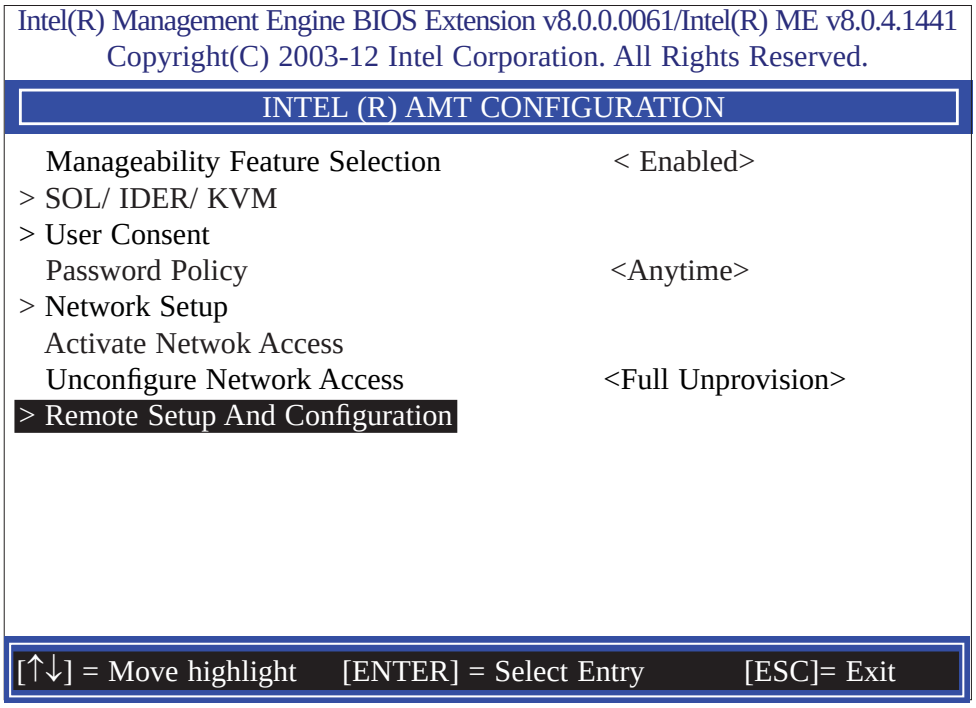
32. Select Previous Menu until you return to the **Intel(R) AMT Configuration** menu. Select **Activate Network Access** then press Enter. Type **Y** then press Enter.



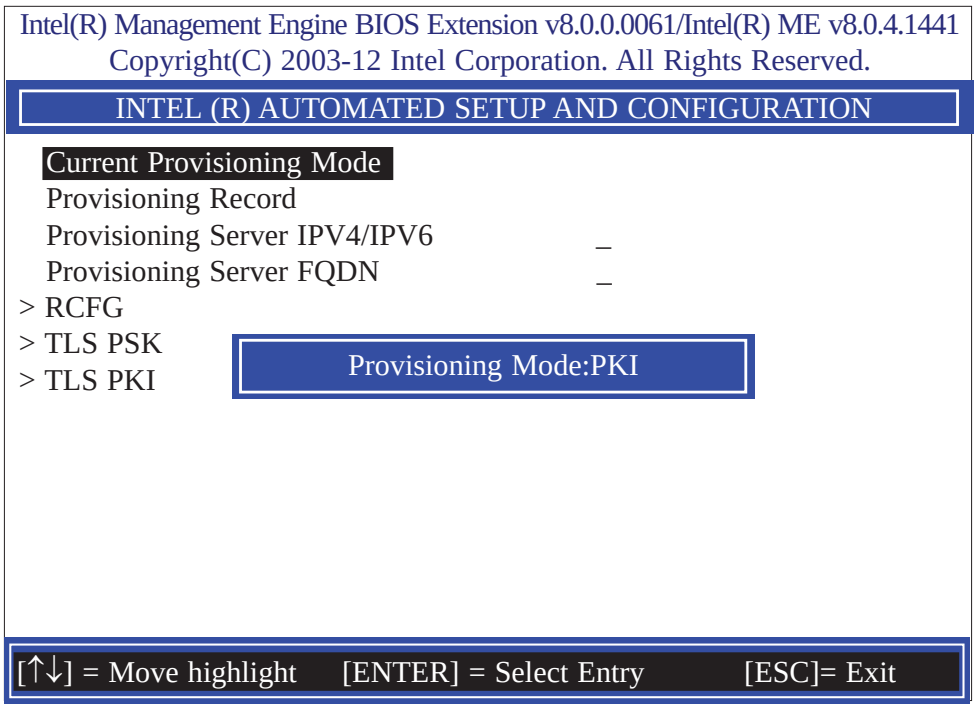
33. In the **Intel(R) AMT Configuration** menu, select **Unconfigure Network Access** then press Enter. Type **Y** then press Enter.



34. In the **Intel(R) AMT Configuration** menu, select **Remote Setup And Configuration** then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) AMT CONFIGURATION
Manageability Feature Selection < Enabled>
> SOL/ IDER/ KVM
> User Consent
Password Policy <Anytime>
> Network Setup
Activate Netwok Access
Unconfigure Network Access <Full Unprovision>
> Remote Setup And Configuration
[↑↓] = Move highlight [ENTER] = Select Entry [ESC]= Exit

35. In the **Intel(R) Automated Setup And Configuration** menu, select **Current Provisioning Mode** then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
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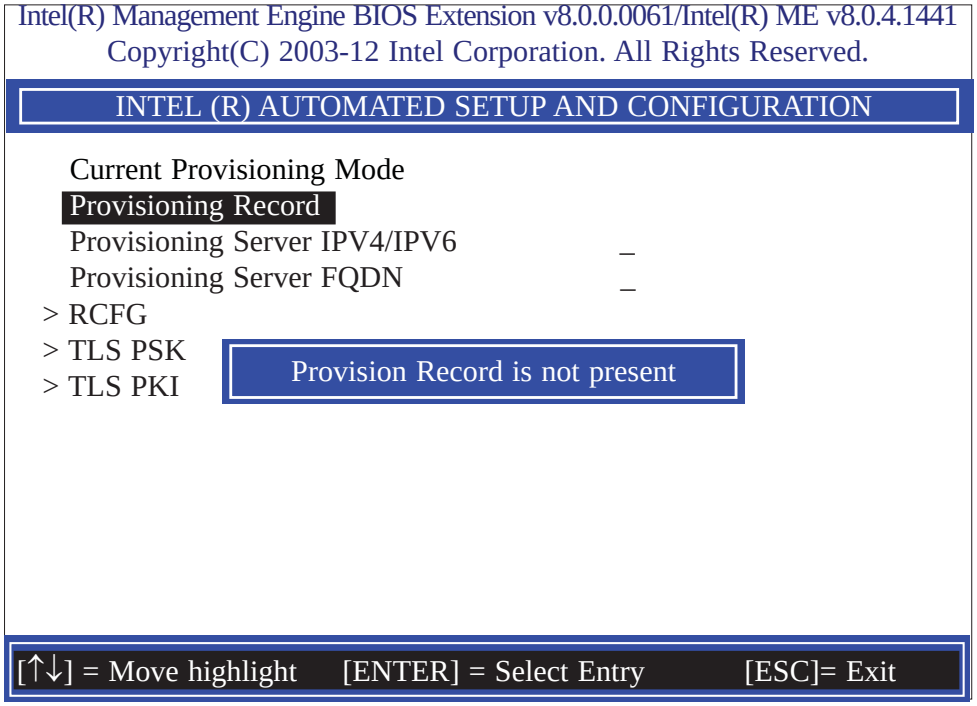
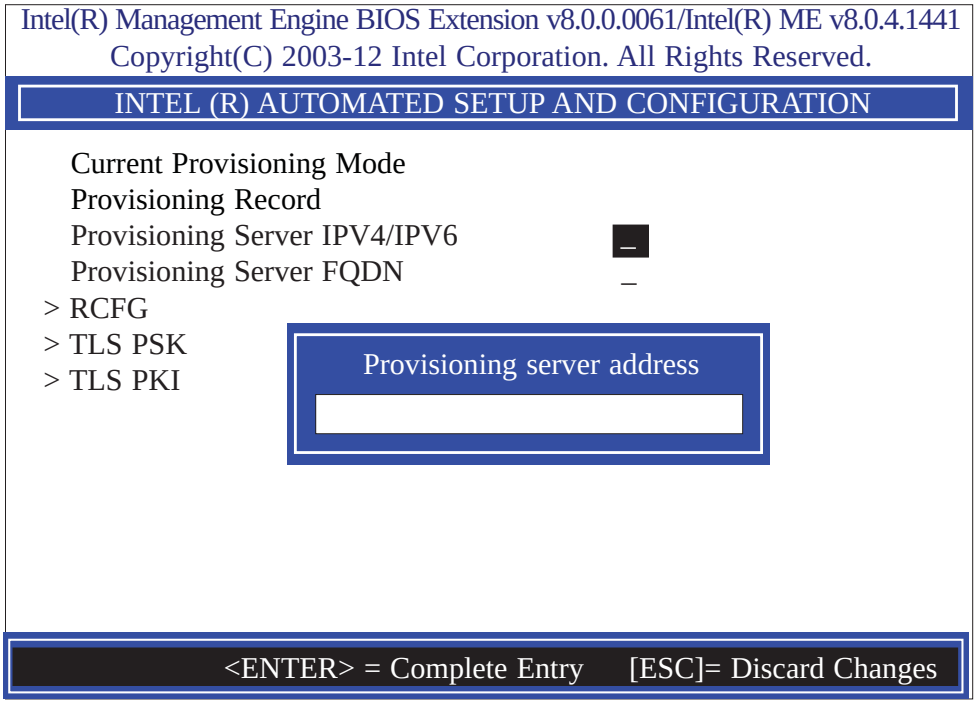
INTEL (R) AUTOMATED SETUP AND CONFIGURATION
Current Provisioning Mode
Provisioning Record
Provisioning Server IPV4/IPV6
Provisioning Server FQDN
> RCFG
> TLS PSK
> TLS PKI
Provisioning Mode:PKI
[↑↓] = Move highlight [ENTER] = Select Entry [ESC]= Exit

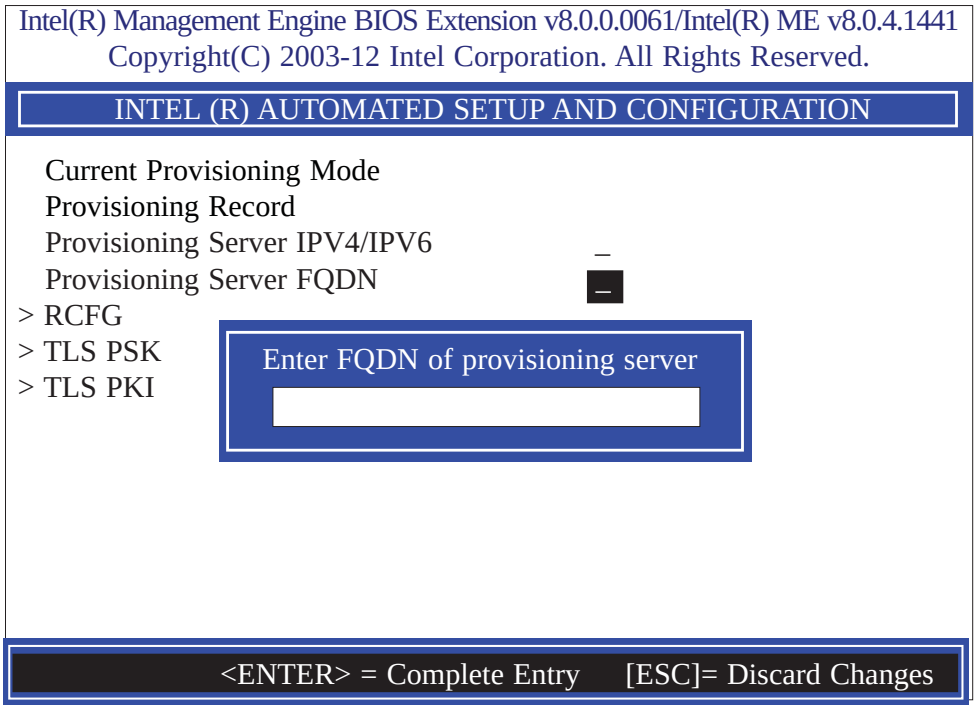
36. In the **Intel(R) Automated Setup And Configuration** menu, select **Provisioning Record** then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) AUTOMATED SETUP AND CONFIGURATION
Current Provisioning Mode
Provisioning Record
Provisioning Server IPV4/IPV6
Provisioning Server FQDN
> RCFG
> TLS PSK
> TLS PKI
Provision Record is not present
[↑↓] = Move highlight [ENTER] = Select Entry [ESC]= Exit

37. Select Previous Menu until you return to the **Intel(R) Automated Setup And Configuration** menu. Select **Provisioning Server IPV4/IPV6** then press Enter. Type server address then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) AUTOMATED SETUP AND CONFIGURATION
Current Provisioning Mode
Provisioning Record
Provisioning Server IPV4/IPV6
Provisioning Server FQDN
> RCFG
> TLS PSK
> TLS PKI
Provisioning server address
<ENTER> = Complete Entry [ESC]= Discard Changes

38. In the **Intel(R) Automated Setup And Configuration** menu, select **Provisioning Server FQDN** then press Enter. Type FQDN of provisioning server then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
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INTEL (R) AUTOMATED SETUP AND CONFIGURATION
Current Provisioning Mode
Provisioning Record
Provisioning Server IPV4/IPV6
Provisioning Server FQDN
> RCFG
> TLS PSK
> TLS PKI
Enter FQDN of provisioning server
<ENTER> = Complete Entry [ESC]= Discard Changes

39. In the **Intel(R) Remote Configuration** menu, select **Start Configuration** then press Enter. Type **Y** then press Enter.

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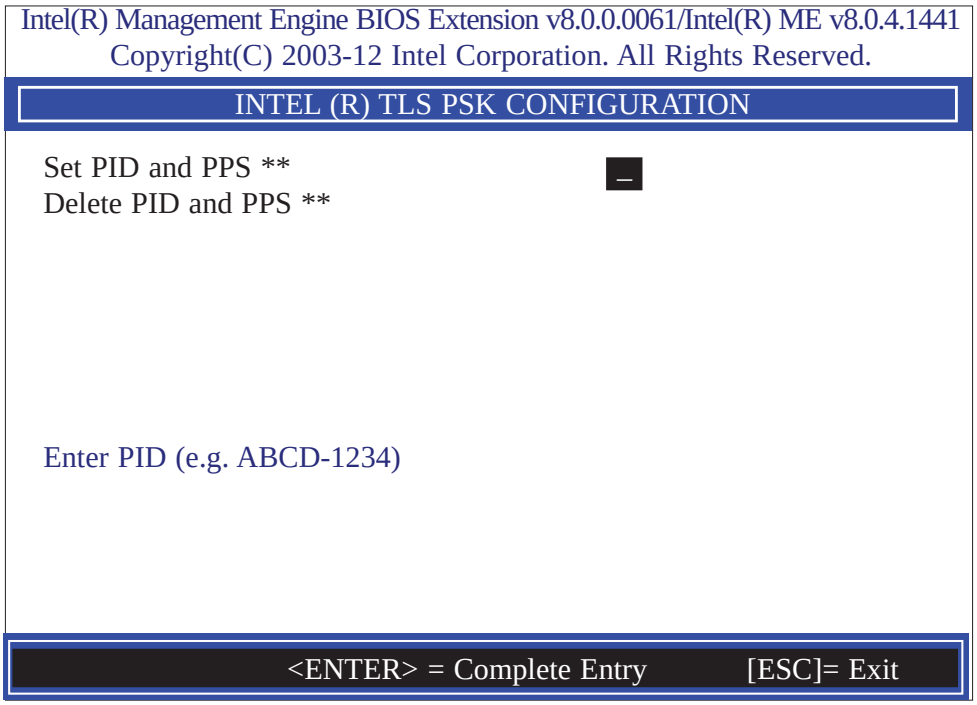
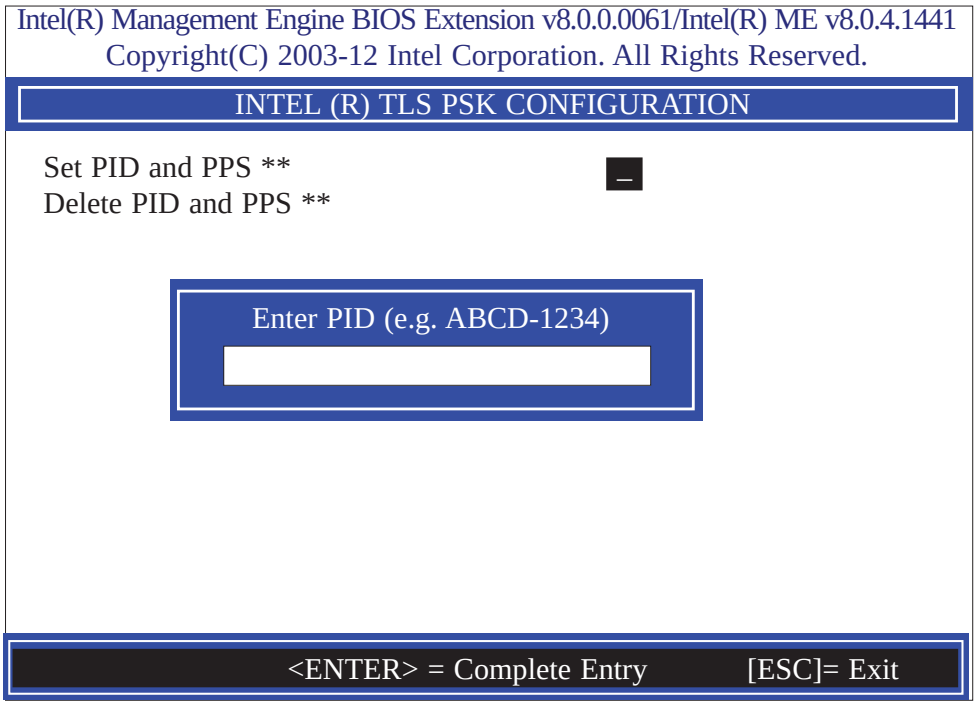
INTEL (R) REMOTE CONFIGURATION
Start Configuration
This will activate Remote Configuration.
Continue: (Y/N)
[↑↓] = Move highlight
[ENTER] = Select Entry
[ESC]= Exit

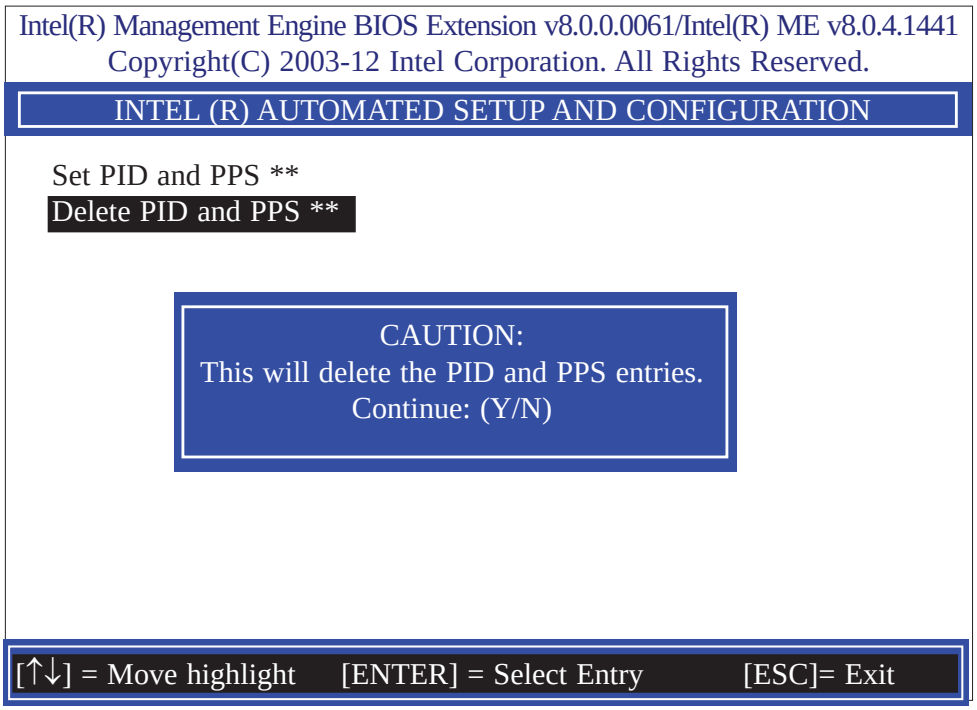
40. In the **Intel(R) Automated Setup And Configuration** menu, select **TLS PSK** then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) TLS PSK CONFIGURATION
Set PID and PPS **
Delete PID and PPS **
Enter PID (e.g. ABCD-1234)
<ENTER> = Complete Entry
[ESC]= Exit

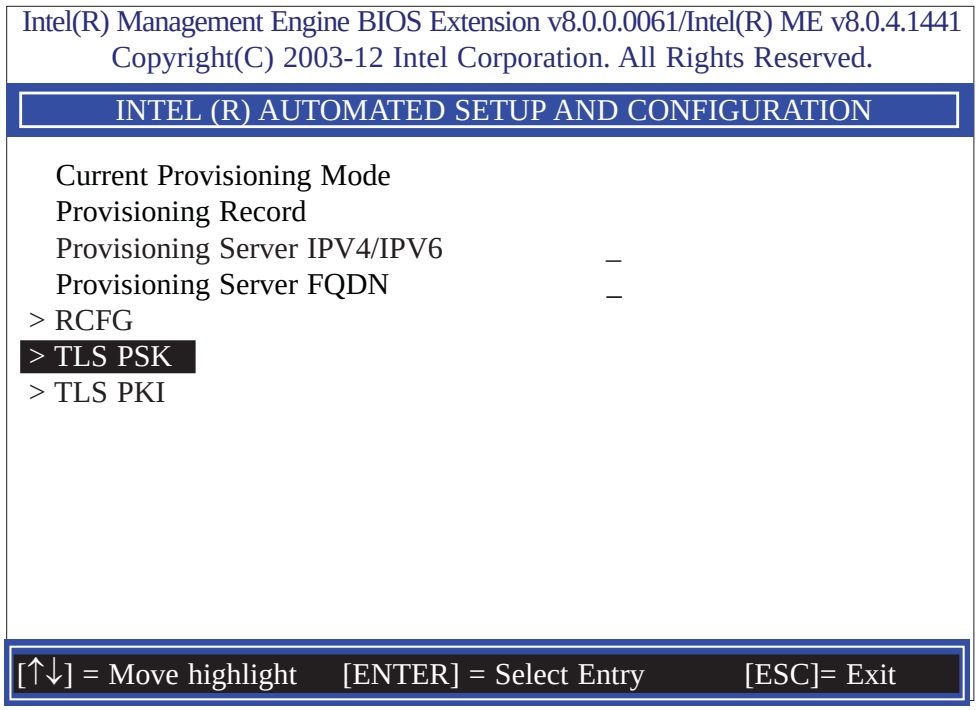
41. In the **Intel(R) Remote Configuration** menu, select **Set PID and PPS **** then press Enter. Type PID code then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) TLS PSK CONFIGURATION
Set PID and PPS **
Delete PID and PPS **
Enter PID (e.g. ABCD-1234)
<ENTER> = Complete Entry
[ESC]= Exit

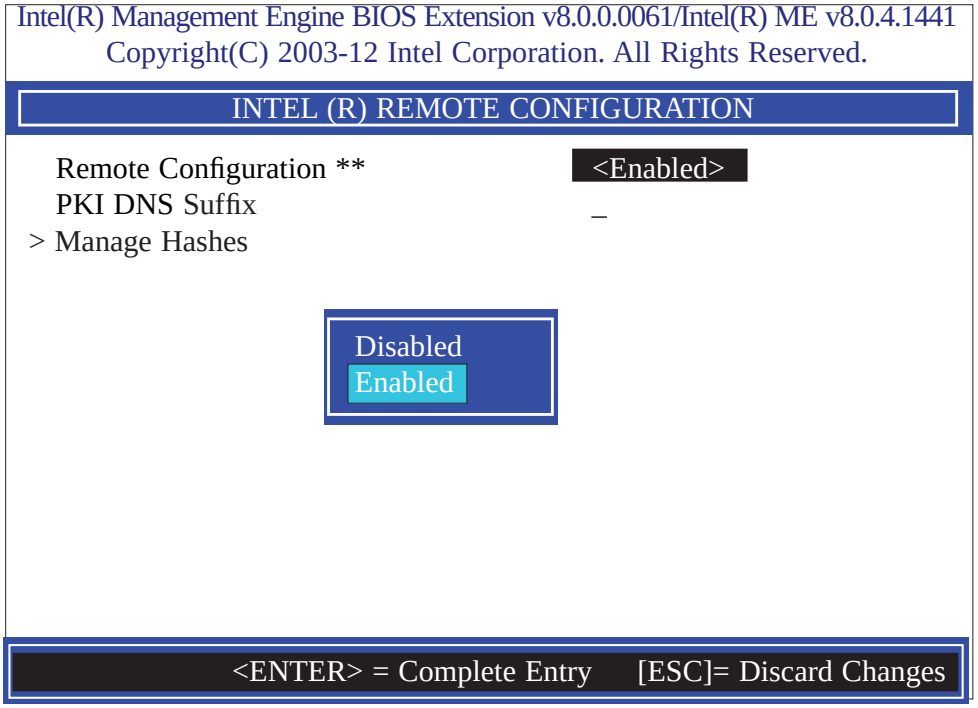
42. In the **Intel(R) Remote Configuration** menu, select **Delete PID and PPS **** then press Enter. Type **Y** then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
INTEL (R) AUTOMATED SETUP AND CONFIGURATION
Set PID and PPS **
Delete PID and PPS **
CAUTION:
This will delete the PID and PPS entries.
Continue: (Y/N)
[↑↓] = Move highlight
[ENTER] = Select Entry
[ESC]= Exit

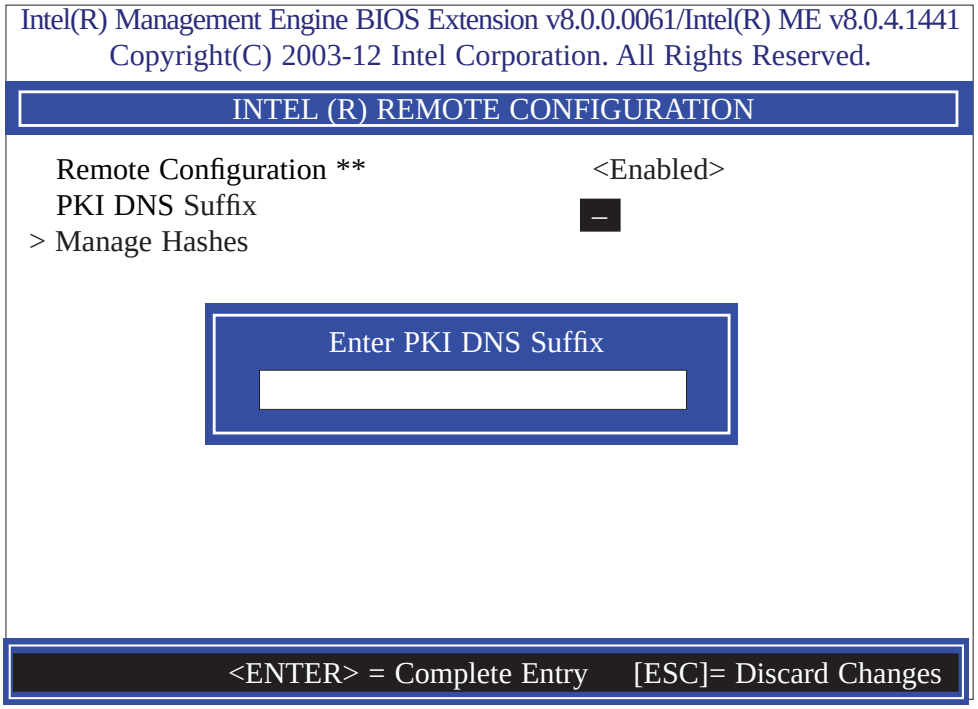
43. Select Previous Menu until you return to the **Intel(R) Automated Setup And Configuration** menu. Select **TLS PKI** then press Enter.



44. In the **Intel(R) Remote Configuration** menu, select **Remote Configuration **** then press Enter. Select Disabled then press Enter.



45. In the **Intel(R) Remote Configuration** menu, select **PKI DNS Suffix** then press Enter. Type PKI DNS Suffix then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
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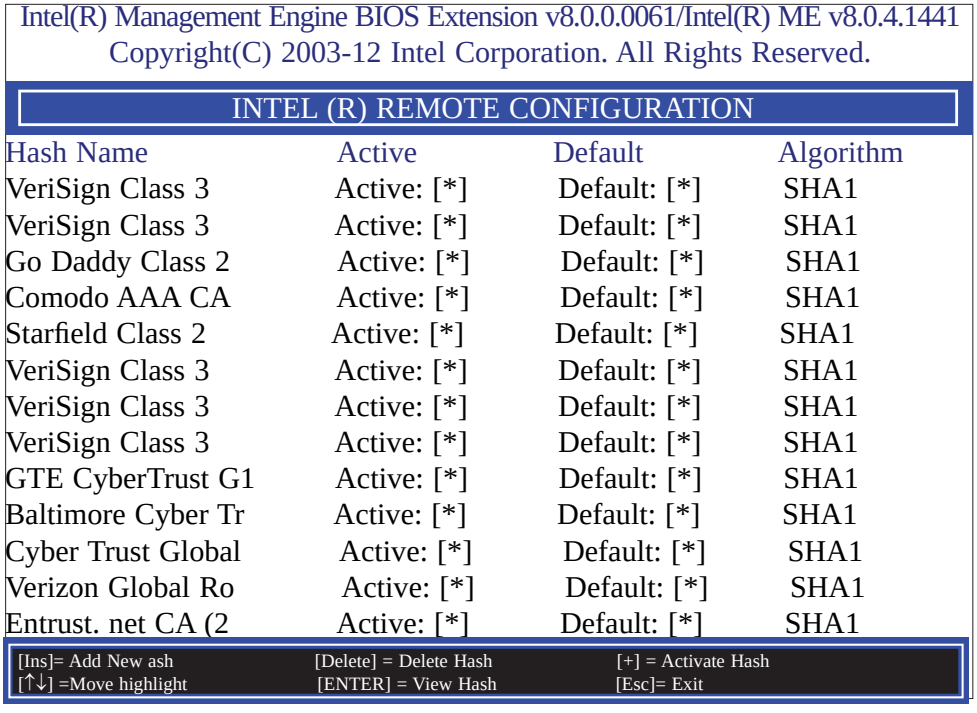
INTEL (R) REMOTE CONFIGURATION
Remote Configuration **
<Enabled>
PKI DNS Suffix
> Manage Hashes
Enter PKI DNS Suffix
<ENTER> = Complete Entry
[ESC]= Discard Changes

46. In the **Intel(R) Remote Configuration** menu, select **Manage Hashes** then press Enter.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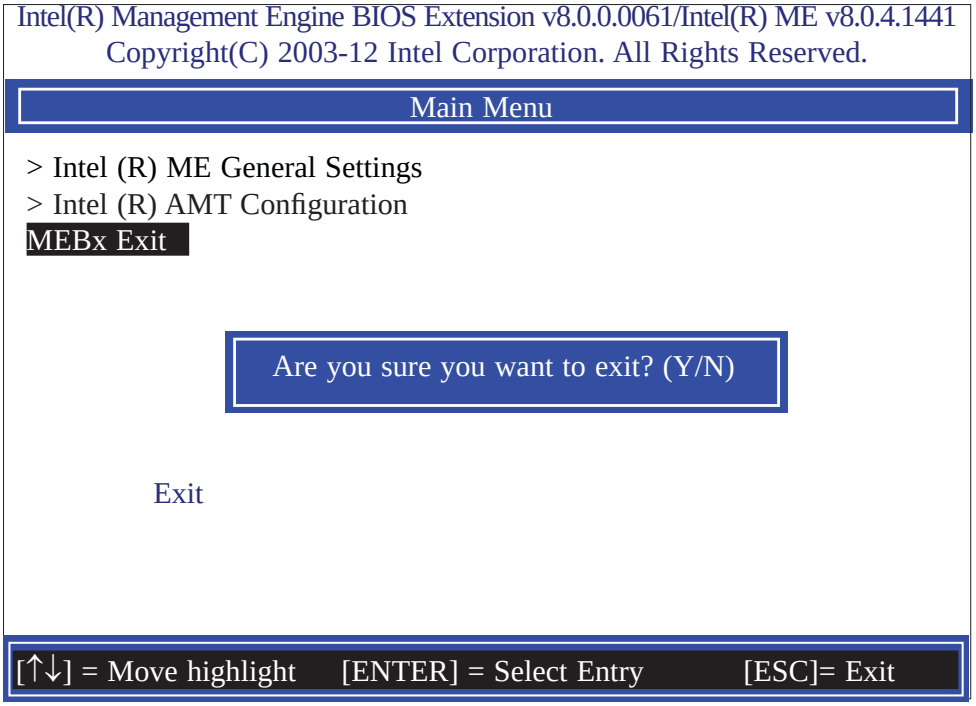
INTEL (R) REMOTE CONFIGURATION
Hash Name Active Default Algorithm
VeriSign Class 3 Active: [*] Default: [*] SHA1
VeriSign Class 3 Active: [*] Default: [*] SHA1
Go Daddy Class 2 Active: [*] Default: [*] SHA1
Comodo AAA CA Active: [*] Default: [*] SHA1
Starfield Class 2 Active: [*] Default: [*] SHA1
VeriSign Class 3 Active: [*] Default: [*] SHA1
VeriSign Class 3 Active: [*] Default: [*] SHA1
VeriSign Class 3 Active: [*] Default: [*] SHA1
GTE CyberTrust G1 Active: [*] Default: [*] SHA1
Baltimore Cyber Tr Active: [*] Default: [*] SHA1
Cyber Trust Global Active: [*] Default: [*] SHA1
Verizon Global Ro Active: [*] Default: [*] SHA1
Entrust. net CA (2 Active: [*] Default: [*] SHA1
[Ins]= Add New ash
[Delete] = Delete Hash
[+] = Activate Hash
[↑↓] =Move highlight
[ENTER] = View Hash
[Esc]= Exit

47. Select Previous Menu until you return to the **Main Menu**. Select **Exit** then press Enter. Type **Y** then press Enter.


Intel(R) Management Engine BIOS Extension v8.0.0.0061/Intel(R) ME v8.0.4.1441
Copyright(C) 2003-12 Intel Corporation. All Rights Reserved.
Main Menu
> Intel (R) ME General Settings
> Intel (R) AMT Configuration
MEBx Exit
Are you sure you want to exit? (Y/N)
Exit
[↑↓] = Move highlight
[ENTER] = Select Entry
[ESC]= Exit

Appendix A - NLITE and AHCI Installation Guide

nLite

nLite is an application program that allows you to customize your XP installation disc by integrating the RAID/AHCI drivers into the disc. By using nLite, the F6 function key usually required during installation is no longer needed.

Note:
The installation steps below are based on nLite version 1.4.9. Installation procedures may slightly vary if you're using another version of the program.

1. Download the program from nLite's offical website.

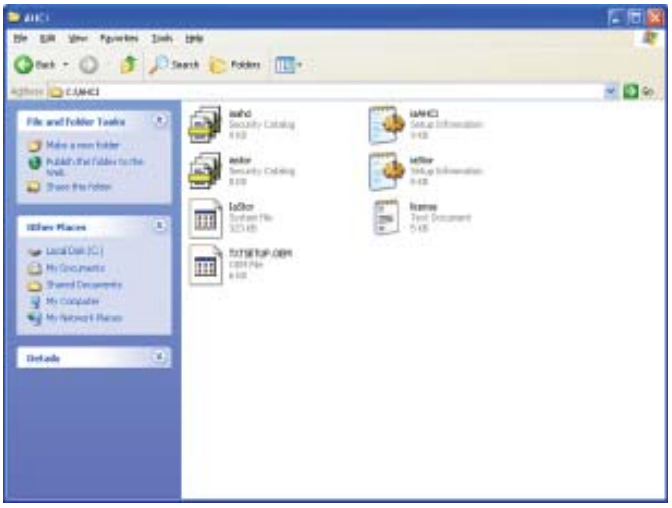
   http://www.nliteos.com/download.html

2. Install nLite.

   Important:
   Due to it's coding with Visual.Net, you may need to first install .NET Framework prior to installing nLite.

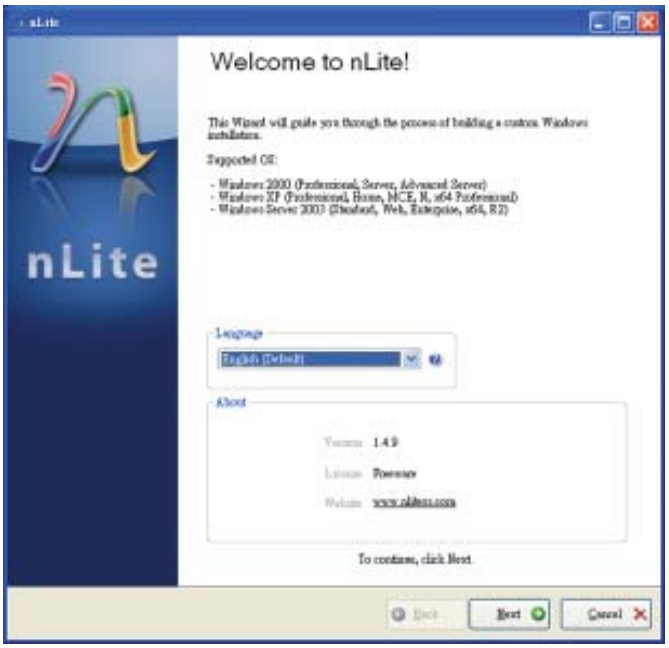
3. Download relevant RAID/AHCI driver files from Intel's website. The drivers you choose will depend on the operating system and chipset used by your computer.

   The downloaded driver files should include iaahci.cat, iaAHCI.inf, iastor.cat, iaStor.inf, IaStor.sys, license.txt and TXTSETUP.OEM.



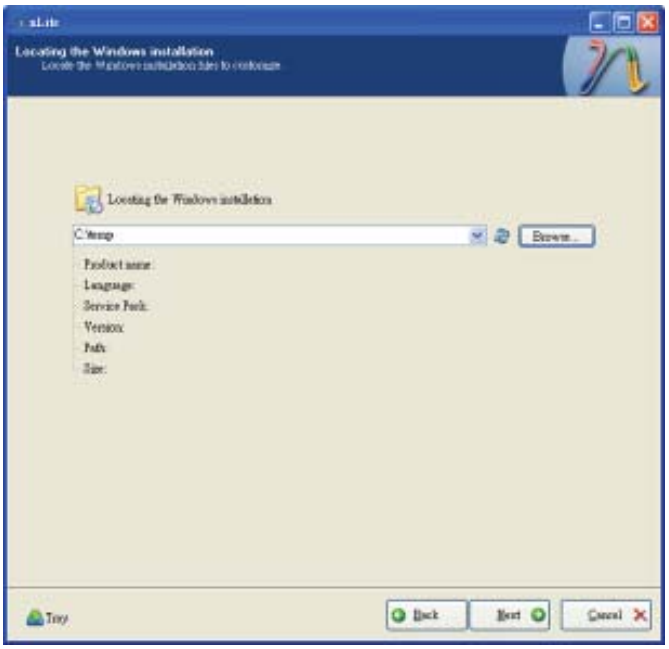
4. Insert the XP installation disc into an optical drive.

5. Launch nLite. The Welcome screen will appear. Click **Next**.

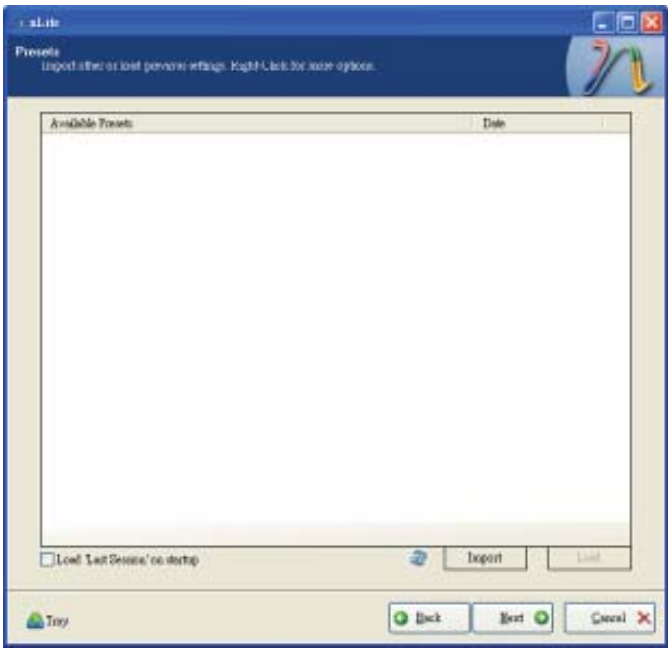


6. Click **Next** to temporarily save the Windows installation files to the designated default folder.

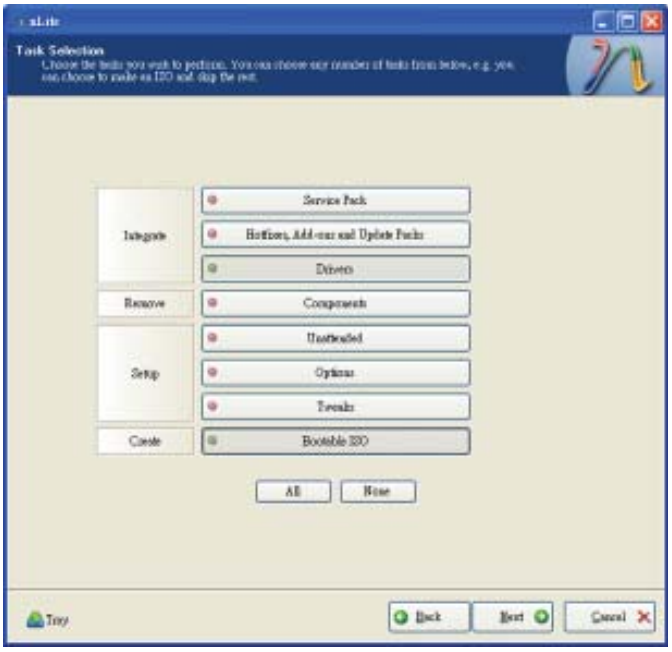
   If you want to save them in another folder, click **Browse**, select the folder and then click **Next**.



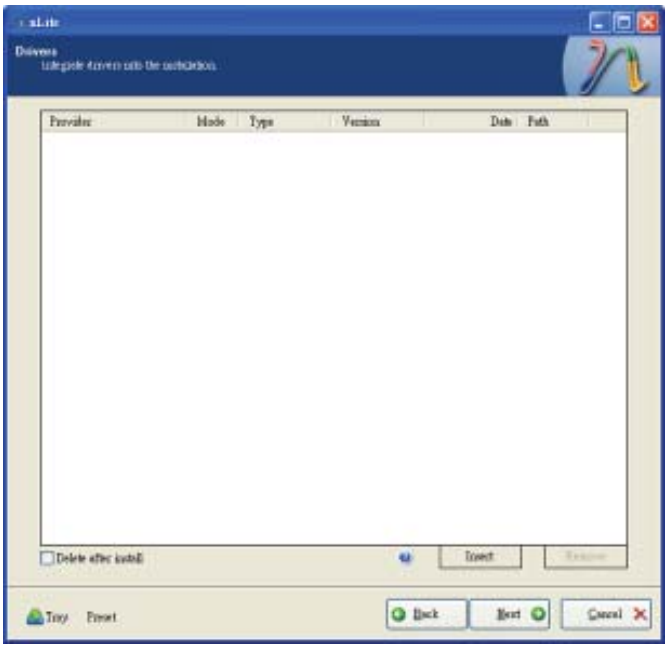
7. Click **Next**.



8. In the Task Selection dialog box, click **Drivers** and **Bootable ISO**. Click **Next**.

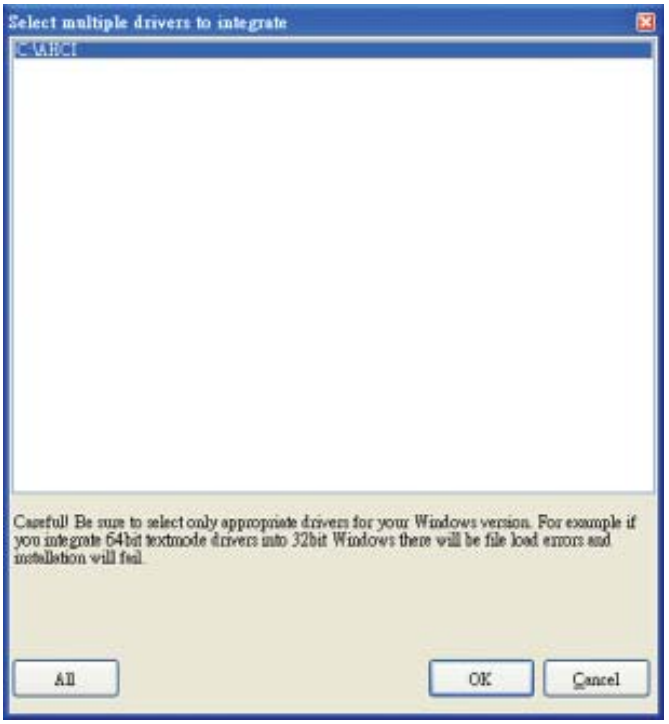


9. Click **Insert** and then select **Multiple driver folder** to select the drivers you will integrate. Click **Next**.



10. Select only the drivers appropriate for the Windows version that you are using and then click **OK**.

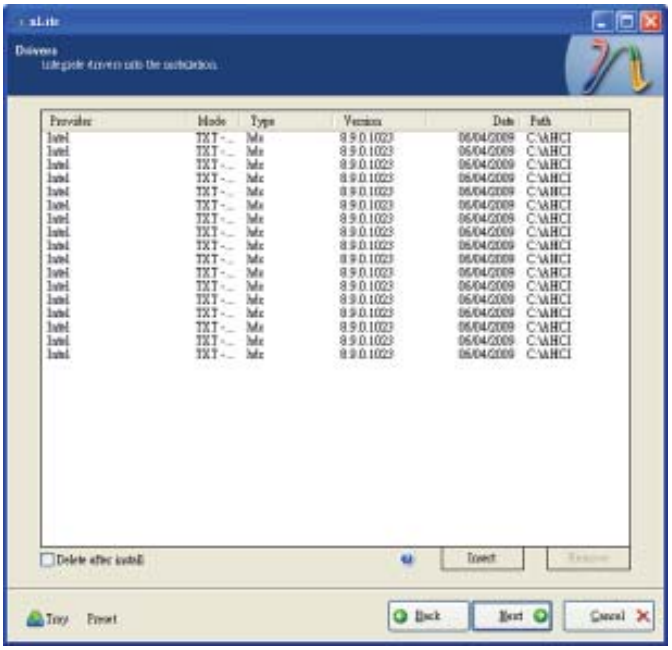
    Integrating 64-bit drivers into 32-bit Windows or vice versa will cause file load errors and failed installation.


Select multiple drivers to integrate
C:\AHCI
Careful! Be sure to select only appropriate drivers for your Windows version. For example if you integrate 64bit textmode drivers into 32bit Windows there will be file load errors and installation will fail.
All
OK
Cancel

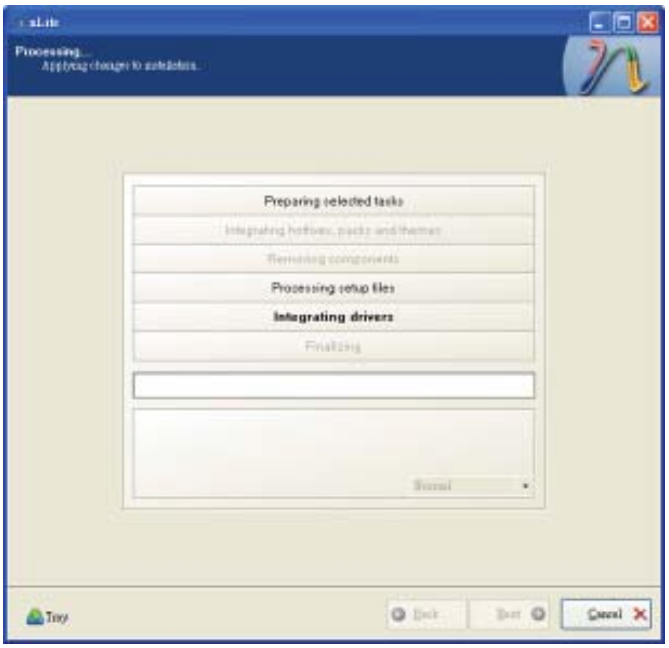
11. If you are uncertain of the southbridge chip used on your motherboard, select all RAID/AHCI controllers and then click **OK**.

Driver Integration Options
Storage Device Textmode Driver
Choose the exact type of hardware and OS if listed.
Driver folder
C:\AHCI
Mode
Regular PNP driver
Textmode driver
Textmode integration options
Hold CTRL to select multiple items. Be careful if your controller even needs more than one. Don't select different OS versions.
Help
OK
Cancel

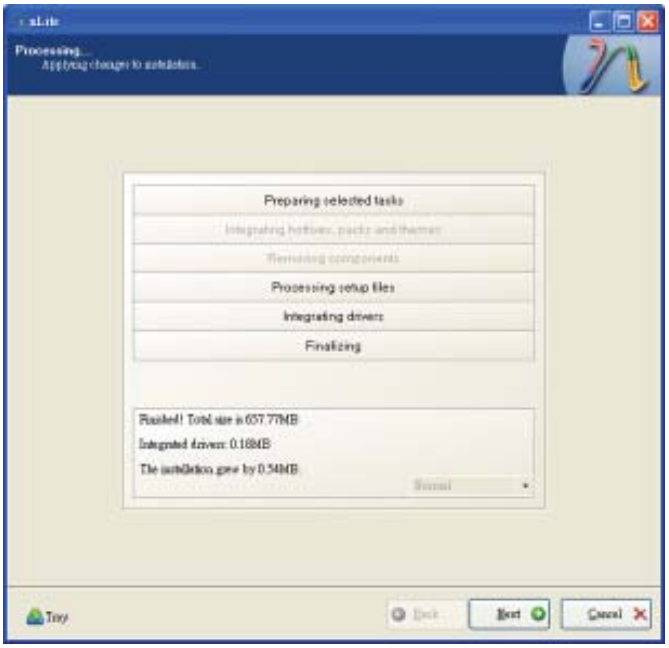
12. Click **Next**.



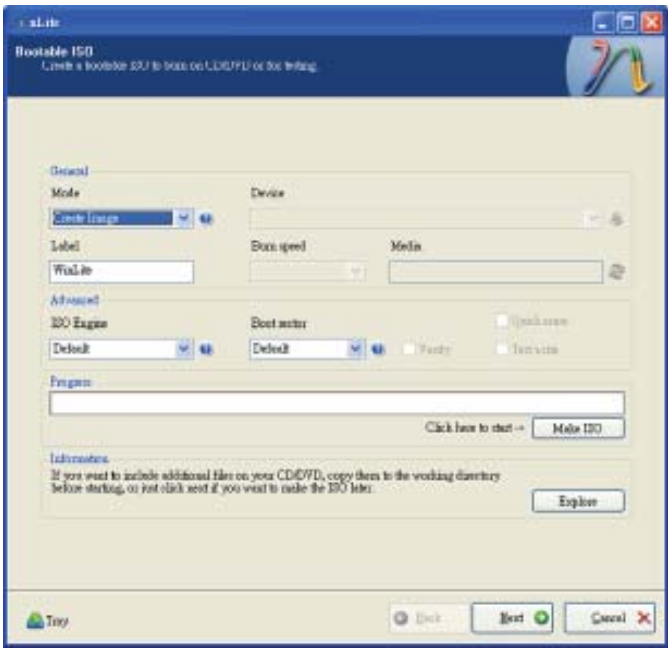
13. The program is currently integrating the drivers and applying changes to the installation.



14. When the program is finished applying the changes, click **Next**.

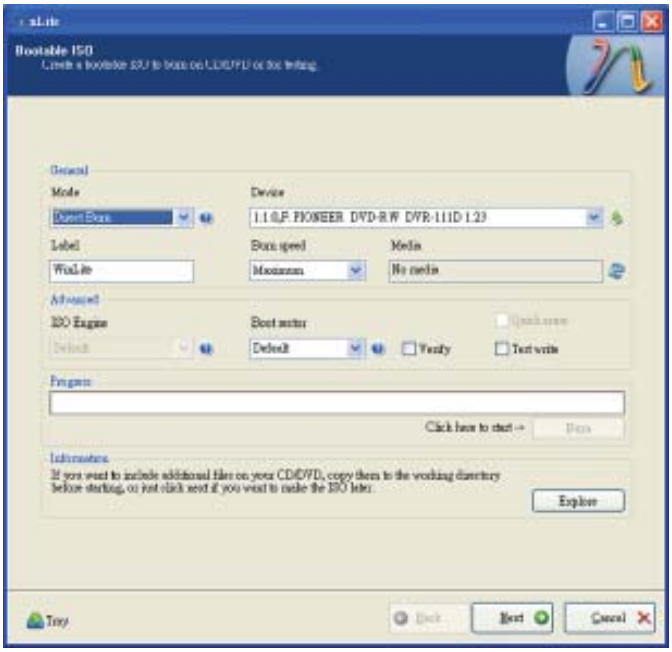


15. To create an image, select the **Create Image** mode under the General section and then click **Next**.



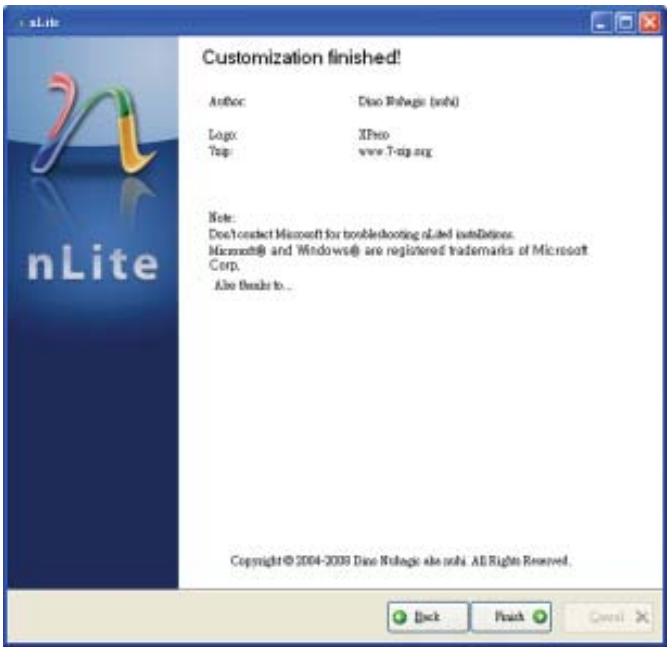
16. Or you can choose to burn it directly to a disc by selecting the **Direct Burn** mode under the General section.

    Select the optical device and all other necessary settings and then click **Next**.



17. You have finished customizing the Windows XP installation disc. Click **Finish**.

    Enter the BIOS utility to configure the SATA controller to RAID/AHCI. You can now install Windows XP.



AHCI

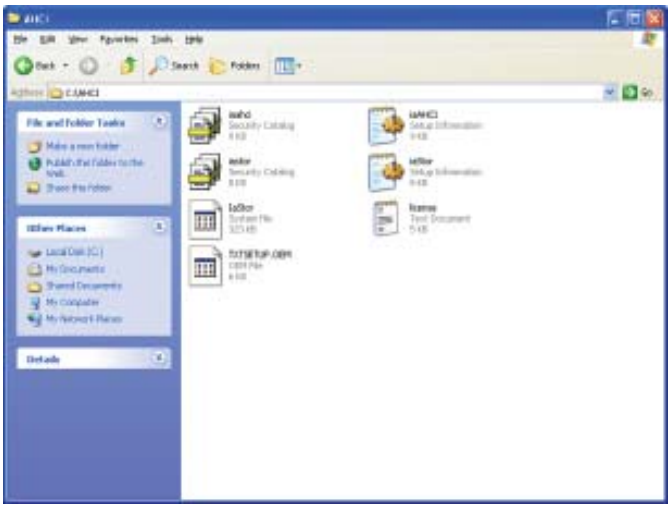
The installation steps below will guide you in configuring your SATA drive to AHCI mode.

1. Enter the BIOS utility and configure the SATA controller to IDE mode.

2. Install Windows XP but do not press F6.

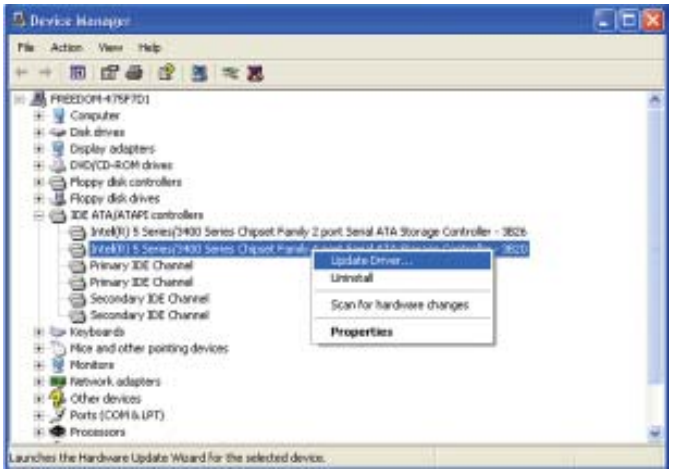
3. Download relevant RAID/AHCI driver files supported by the motherboard chipset from Intel's website.

   Transfer the downloaded driver files to C:\AHCI.



4. Open Device Manager and right click on one of the Intel Serial ATA Storage Controllers, then select **Update Driver**.

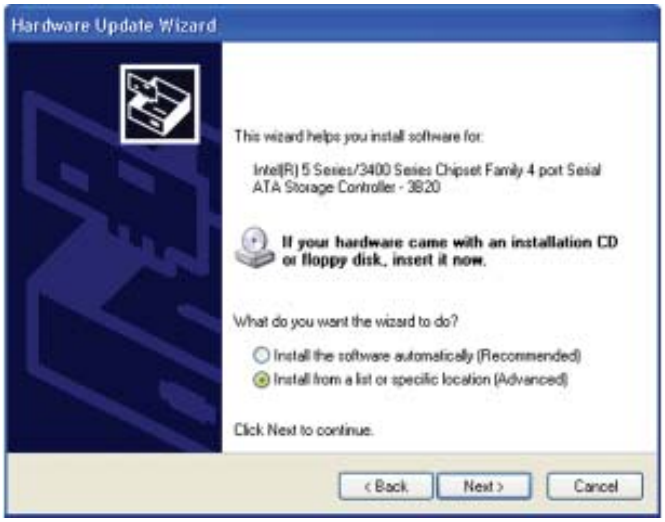
   If the controller you selected did not work, try selecting another one.



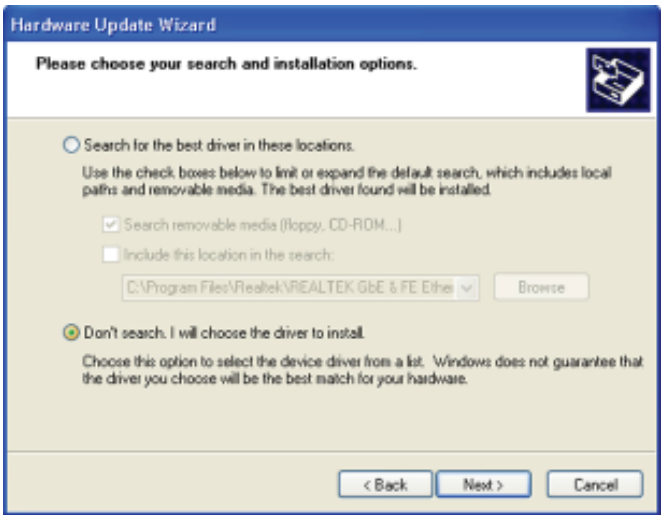
5. In the Hardware Update Wizard dialog box, select **"No, not this time"** then click **Next**.

Hardware Update Wizard
Welcome to the Hardware Update Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

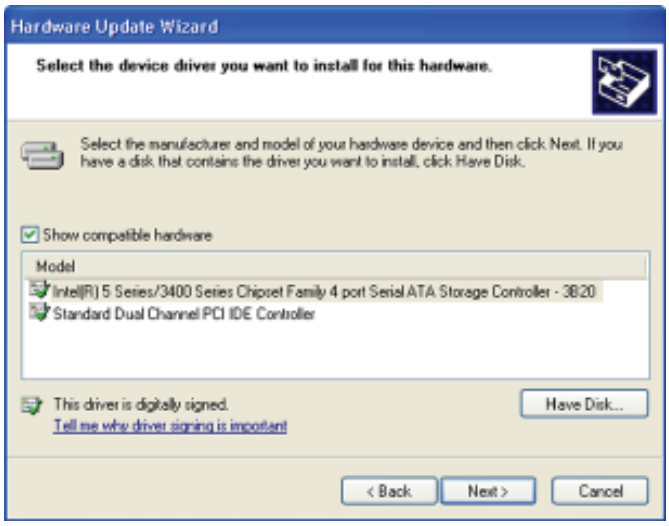
6. Select **"Install from a list or specific location (Advanced)"** and then click **Next**.


Hardware Update Wizard
This wizard helps you install software for:
Intel(R) 5 Series/3400 Series Chipset Family 4 port Serial ATA Storage Controller - 3820
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

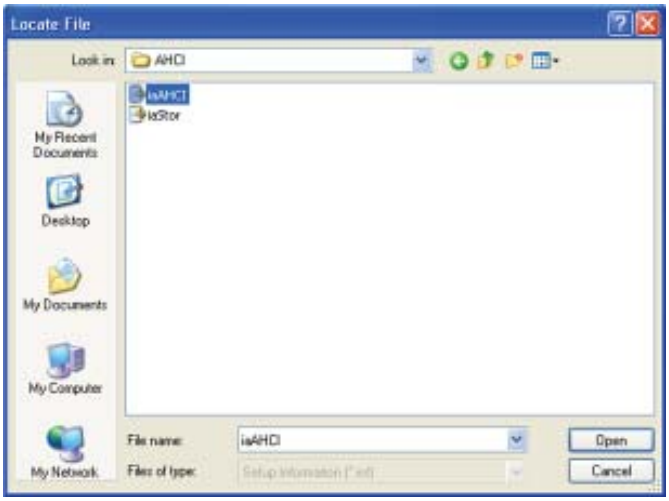
7. Select **"Don't search. I will choose the driver to install"** and then click **Next**.


Hardware Update Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
C:\Program Files\Realtek\REALTEK GbE & FE Ethe
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

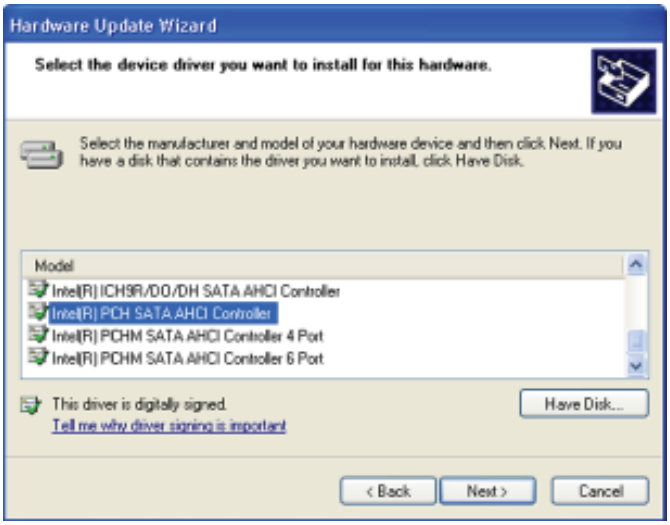
8. Click **"Have Disk"**.


Hardware Update Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Show compatible hardware
Model
Intel(R) 5 Series/3400 Series Chipset Family 4 port Serial ATA Storage Controller - 3B20
Standard Dual Channel PCI IDE Controller
This driver is digitally signed.
Tell me why driver signing is important
Have Disk...
< Back
Next >
Cancel

9. Select C:\AHCI\iaAHCI.inf and then click **Open**.



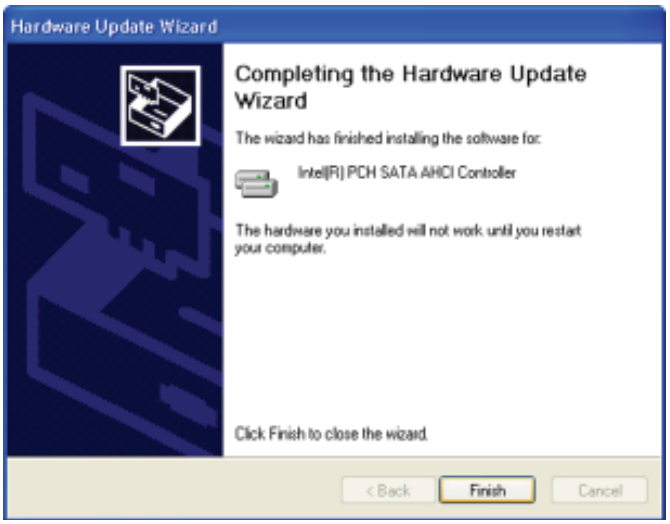
10. Select the appropriate AHCI Controller of your hardware device and then click **Next**.


Hardware Update Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Model
Intel(R) ICH9R/DO/DH SATA AHCI Controller
Intel(R) PCH SATA AHCI Controller
Intel(R) PCHM SATA AHCI Controller 4 Port
Intel(R) PCHM SATA AHCI Controller 6 Port
This driver is digitally signed.
Tell me why driver signing is important
Have Disk...
< Back
Next >
Cancel

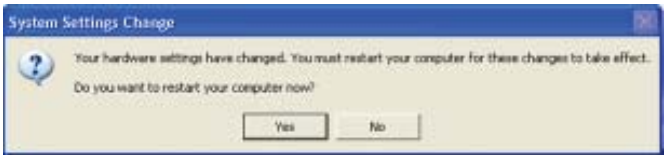
11. A warning message appeared because the selected SATA controller did not match your hardware device.

    Ignore the warning and click **Yes** to proceed.

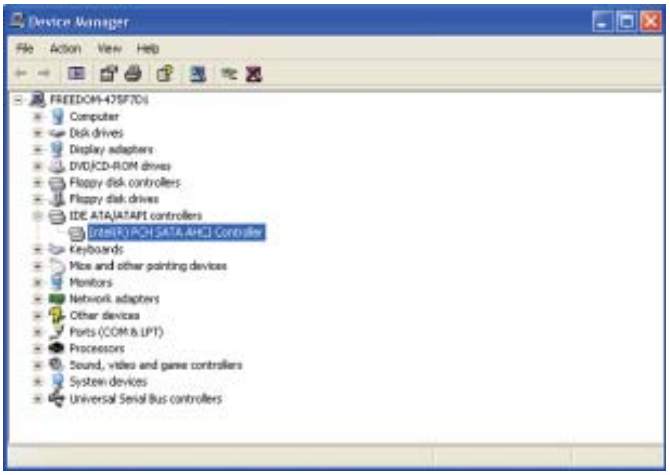
12. Click **Finish**.


Hardware Update Wizard
Completing the Hardware Update Wizard
The wizard has finished installing the software for:
Intel(R) PCH SATA AHCI Controller
The hardware you installed will not work until you restart your computer.
Click Finish to close the wizard.
< Back
Finish
Cancel

13. The system's settings have been changed. Windows XP requires that you restart the computer. Click **Yes**.


System Settings Change
Your hardware settings have changed. You must restart your computer for these changes to take effect.
Do you want to restart your computer now?
Yes
No

14. Enter the BIOS utility and modify the SATA controller from IDE to AHCI. By doing so, Windows will work normally with the SATA controller that is in AHCI mode.



Appendix B - Watchdog Sample Code

```
;Software programming example:

;--------------------------------------------
;(1) Enter Super IO Configuration mode
;--------------------------------------------
MOV         DX,2EH
MOV         AL,87H
OUT         DX,AL
OUT         DX,AL

;-------------------------------------------------------------------------------------------
;(2) Configuration Logical Device 7, register CRF5/CRF6 (WDT Control /WDT timer)
;-------------------------------------------------------------------------------------------
MOV         DX,2EH
MOV         AL,07H              ;Ready to Program Logical Device
OUT         DX,AL

MOV         DX,2FH
MOV         AL,07H              ;Select Logical Device 7
OUT         DX,AL

MOV         DX,2EH
MOV         AL, F6H             ;Select watchdog timer register
OUT         DX,AL

MOV         DX,2FH
MOV         AL,10H              ;Set watchdog timer value
OUT         DX,AL

MOV         DX,2EH
MOV         AL, F5H             ;Select watchdog Control Register
OUT         DX,AL

MOV         DX,2FH
MOV         AL,61H              ;Set Watchdog Control Value
OUT         DX,AL

;-------------------------------------------------------------
;(1) Exit extended function mode
;-------------------------------------------------------------
MOV          DX,2EH
MOV          AL,AAH
OUT          DX,AL
```

Appendix C - System Error Message

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message, PRESS F1 TO CONTINUE, CTRL-ALT-ESC or DEL TO ENTER SETUP, will be shown in the information box at the bottom. Enter Setup to correct the error.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list indicates the error messages for all Awards BIOSes:

CMOS BATTERY HAS FAILED

The CMOS battery is no longer functional. It should be replaced.

Important
Danger of explosion if battery incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the battery manufacturer's instructions.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISPLAY SWITCH IS SET INCORRECTLY

The display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, either turn off the system and change the jumper or enter Setup and change the VIDEO selection.

FLOPPY DISK(S) fail (80)

Unable to reset floppy subsystem.

FLOPPY DISK(S) fail (40)

Floppy type mismatch.

Hard Disk(s) fail (80)

HDD reset failed.

Hard Disk(s) fail (40)

HDD controller diagnostics failed.

System Error Message

Hard Disk(s) fail (20)

HDD initialization error.

Hard Disk(s) fail (10)

Unable to recalibrate fixed disk.

Hard Disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out - Unlock the key

The BIOS detects that the keyboard is locked. Keyboard controller is pulled low.

Keyboard error or no keyboard present

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

Manufacturing POST loop

System will repeat POST procedure infinitely while the keyboard controller is pull low. This is also used for the M/B burn in test at the factory.

BIOS ROM checksum error - System halted

The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail

The BIOS reports memory test fail if the memory has error(s).

Appendix D - Troubleshooting

Troubleshooting Checklist

This chapter of the manual is designed to help you with problems that you may encounter with your personal computer. To efficiently troubleshoot your system, treat each problem individually. This is to ensure an accurate diagnosis of the problem in case a problem has multiple causes.

Some of the most common things to check when you encounter problems while using your system are listed below.

1. The power switch of each peripheral device is turned on.

2. All cables and power cords are tightly connected.

3. The electrical outlet to which your peripheral devices are connected is working. Test the outlet by plugging in a lamp or other electrical device.

4. The monitor is turned on.

5. The display's brightness and contrast controls are adjusted properly.

6. All add-in boards in the expansion slots are seated securely.

7. Any add-in board you have installed is designed for your system and is set up correctly.

Monitor/Display

If the display screen remains dark after the system is turned on:

1. Make sure that the monitor's power switch is on.

2. Check that one end of the monitor's power cord is properly attached to the monitor and the other end is plugged into a working AC outlet. If necessary, try another outlet.

3. Check that the video input cable is properly attached to the monitor and the system's display adapter.

4. Adjust the brightness of the display by turning the monitor's brightness control knob.

The picture seems to be constantly moving.

1. The monitor has lost its vertical sync. Adjust the monitor's vertical sync.
2. Move away any objects, such as another monitor or fan, that may be creating a magnetic field around the display.
3. Make sure your video card's output frequencies are supported by this monitor.

The screen seems to be constantly wavering.

1. If the monitor is close to another monitor, the adjacent monitor may need to be turned off. Fluorescent lights adjacent to the monitor may also cause screen wavering.

Power Supply

When the computer is turned on, nothing happens.

1. Check that one end of the AC power cord is plugged into a live outlet and the other end properly plugged into the back of the system.
2. Make sure that the voltage selection switch on the back panel is set for the correct type of voltage you are using.
3. The power cord may have a "short" or "open". Inspect the cord and install a new one if necessary.

Floppy Drive

The computer cannot access the floppy drive.

1. The floppy diskette may not be formatted. Format the diskette and try again.
2. The diskette may be write-protected. Use a diskette that is not write-protected.
3. You may be writing to the wrong drive. Check the path statement to make sure you are writing to the targeted drive.
4. There is not enough space left on the diskette. Use another diskette with adequate storage space.

Hard Drive

Hard disk failure.

1. Make sure the correct drive type for the hard disk drive has been entered in the BIOS.

2. If the system is configured with two hard drives, make sure the bootable (first) hard drive is configured as Master and the second hard drive is configured as Slave. The master hard drive must have an active/bootable partition.

Excessively long formatting period.

If your hard drive takes an excessively long period of time to format, it is likely a cable connection problem. However, if your hard drive has a large capacity, it will take a longer time to format.

Serial Port

The serial device (modem, printer) doesn't output anything or is outputting garbled characters.

1. Make sure that the serial device's power is turned on and that the device is on-line.

2. Verify that the device is plugged into the correct serial port on the rear of the computer.

3. Verify that the attached serial device works by attaching it to a serial port that is working and configured correctly. If the serial device does not work, either the cable or the serial device has a problem. If the serial device works, the problem may be due to the onboard I/O or the address setting.

4. Make sure the COM settings and I/O address are configured correctly.

Keyboard

Nothing happens when a key on the keyboard was pressed.

1. Make sure the keyboard is properly connected.

2. Make sure there are no objects resting on the keyboard and that no keys are pressed during the booting process.

System Board

1. Make sure the add-in card is seated securely in the expansion slot. If the add-in card is loose, power off the system, re-install the card and power up the system.

2. Check the jumper settings to ensure that the jumpers are properly set.

3. Verify that all memory modules are seated securely into the memory sockets.

4. Make sure the memory modules are in the correct locations.

5. If the board fails to function, place the board on a flat surface and seat all socketed components. Gently press each component into the socket.

6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults.